JULY - AUGUST
VOLUME 13 NUMBER 4

Yankee WINGS

THE MAGAZINE OF THE YANKEE AIR FORCE

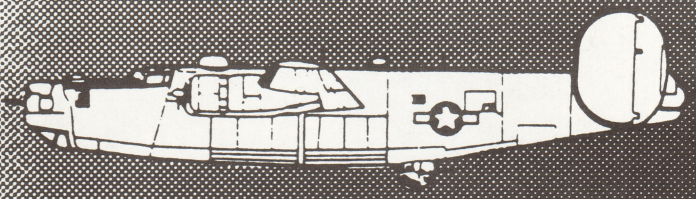
YANKEE AIR FORCE

In this issue...

- ✪ *Essex*-Class Aircraft Carriers in WWII
- ✪ The Carrier Revolution
- ✪ Nuclear Carrier Cut-Away Drawing
- ✪ Bombing of Monte Cassino

...and more!

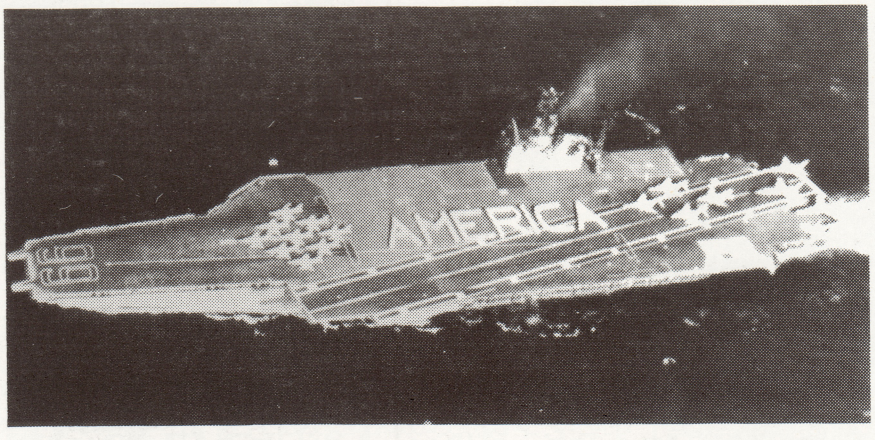
Yankee WINGS



Inside Yankee Wings... **Official Publication of The Yankee Air Force©**

These are the introductory remarks to another special issue, in which the staff has attempted to cover the incredibly complex subject of aircraft carriers. The lead article by **Jack Stankrauff** was probably his greatest challenge in the more-than-ten years he has written for this publication. This is because the subject of the *Essex*-class carriers is intertwined with so many related subjects, such as the (dry) technical description; the operational use on either the macro (campaigns, fleet battles) or the micro (battles by individual ships and pilots) scale; the rapid evolution of carrier tactics during WWII; and the development of forward bases and the mobile logistics scheme by which underway replenishment groups "appeared" over the horizon to replenish the carriers with everything from fuel, beans and bullets to mail, spare airplanes and spare parts. After the numerous hours which Jack spent on the story, the editor put in many more to ensure the proper coverage of the subject.

The technical description seemed an excellent subject for the pictorial prepared by **Gary Redfern**, which adorns our centerspread. Another fascinating aspect is the incredible changes which were forced upon Naval Aviation by the attempt to operate jet aircraft from carriers, and this article begins on page 15. This revolution is described in much greater detail in the two books which are reviewed by the Armchair Aviator, beginning on page 18. And for those readers who have read the entire magazine and hunger for more, the Yankee Air Force Library would be a good place to look.



The *USS America (CV-66)* is the next-to-last of the U.S. Navy's fossile-fuelled carriers. (USN)

On the Cover: An F-4 Phantom II is hooked to the catapult bridle in this carrier action scene by artist **Jim Serdenis**.

~ Jim Hanford

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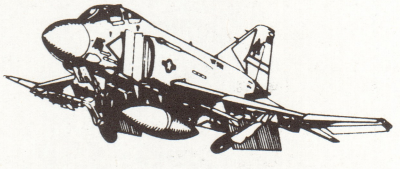


Aircraft line art in this issue courtesy of Squadron Signal Mail Order, unless otherwise noted.

Fist of the Fleet: *Essex*-Class Carriers in World War II

by Jack B. Stankrauff

One of the great strategic lessons of World War II was the emergence of the aircraft carrier as the new Queen of the Seas, relegating the big-gun battleships to a support status. And the epitome of fleet carrier design was the U.S. Navy's *Essex* class. These ships and their embarked air groups comprised of fighters and torpedo and dive bombers, projected airpower wherever it was needed, not only in WWII, but in the Korean and Vietnam Wars as well.

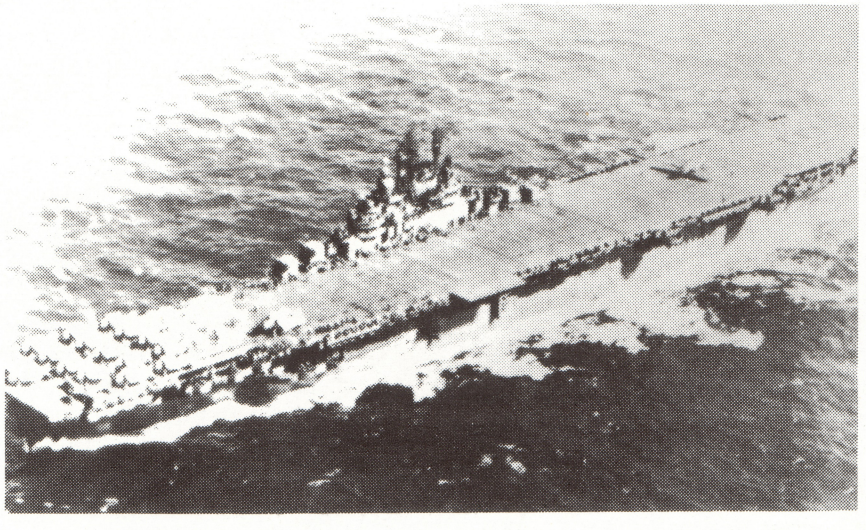
Carrier aviation had a slow start, since it developed during a period when doctrine dictated that the battleship was the fleet's capital ship. In the 1920s the Navy first experimented with carrier aviation, using an aircraft landing deck built atop an obsolete collier – the *USS Langley (CV-1)*. Later two notable exercises demonstrated the aircraft carrier's potential as an offensive weapon, but it would take a world war to bring the concept to maturity.

First "Attacks" on Pearl Harbor

The *Langley* made a surprise attack on the Hawaiian naval base at Pearl Harbor in 1928. Her fighters and bombers arrived over the anchorage and "destroyed" the ships moored there before any defending aircraft could get aloft or ships put out to sea. Admiral H.D. Yarnell, the first flag officer to realize the offensive potential of aircraft carriers, also successfully attacked Pearl Harbor in a mock exercise on Sunday, December 7, 1932, using a task force comprised of the *USS Lexington (CV-2)*, *USS Saratoga (CV-3)* and four destroyers. Yarnell based his attack plan on four proven factors: (1) a small task force is harder to locate in the vast Pacific Ocean than a larger, full-sized fleet; (2) rain squalls and low clouds – if used correctly – provide excellent cover for a small task force; (3) Oahu's 2,800-foot Koolau Mountain Range forces clouds to mass and unload their moisture, out of which carrier-launched planes could emerge into the clear skies over Pearl Harbor; and (4) Army and Navy forces would not be ready for an attack on Sunday, a customary Christian day of rest. One hundred fifty-two *Lexington* and *Saratoga* planes attacked the fleet anchorage and nearby installations, "strafing" and "bombing" ships, parked aircraft, and barracks. Not one plane rose in defense. It was an ominous portent of the disastrous attack on Sunday, December 7, 1941.

Naval Carrier Expansion

Other events would also contribute to the growth of the U.S. Navy's carrier strength. In May 1939 Congress passed the Naval Expansion Act, which authorized 40,000 tons of carrier construction. Thirteen months later the Navy Board produced design plans for the *Essex* class fleet carriers. In the summer of 1940, after Congress passed the Eleven Per Cent Fleet Expansion and the Two-Ocean Navy bills, the keels were laid for the *Essex*, *Bon Homme Richard*, and the *Intrepid*. The Navy was forced to wait almost three years, however, until their first *Essex* carriers joined the fleet. Another important factor in the Navy's expansion was President Franklin Delano Roosevelt, who had served as Assistant Secretary of the Navy in the Wilson Administration during World War I, and was fond of calling the U.S. Navy "my navy."



This March 1944 photo of the second *USS Lexington (CV-16)* illustrates well the general features of the *Essex*-class carriers. (USN)

Admirals Halsey (l) and Nimitz with Nimitz' Chief of Staff, RAdm. Forrest Sherman. (USN)

The early years of World War II provided undisputed proof that the aircraft carrier had become the preeminent weapon at sea. On November 11, 1940 torpedo planes from the British carrier *HMS Illustrious* disabled three battleships, a cruiser, and two destroyers – half the Italian fleet – at Taranto, Italy. Japanese naval planners studied this action with great interest in the successful use of aerial torpedos in a shallow harbor. On December 7, 1941, planes from six Japanese aircraft carriers attacked Pearl Harbor, sinking five battleships, three destroyers and a minelayer, and destroying over 160 aircraft. Three days later some 75 land-based aircraft of the Japanese 22nd Air Flotilla caught the British battleship *Prince of Wales* accompanied by the battlecruiser *Repulse* without air support in the South China Sea. The attackers overwhelmed Admiral Tom Phillips' "wall of steel," and sunk both ships in just over two hours. Some 840 seamen were lost, along with their admiral, as accompanying destroyers rescued another 2,081. Ironically the new aircraft carrier *HMS Indomitable* should have accompanied them, but had been damaged in an accidental grounding at Kingston, Jamaica, in November.

Fortunately there were no U.S. carriers in Pearl Harbor on December 7. Both *Lexington* and the *USS Enterprise (CV-6)* were a day's steaming away, having delivered aircraft to the Marine garrisons at Wake and Midway, and *Saratoga* was in San Diego. The remainder of the U.S. Navy's carrier strength, the *USS Yorktown (CV-5)*, *USS Hornet (CV-8)*, *USS Ranger (CV-4)*, and the *USS Wasp (CV-7)* were in the Atlantic.

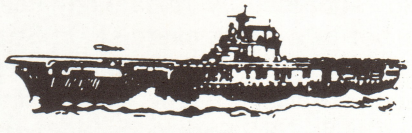
In the first six months of the Pacific War, the Imperial Japanese Navy ran wild across the Pacific and Indian Oceans. (See "Romp of the Kido Butai," March/April 1992 *Yankee Wings*.) The U.S. Navy, however, was not out. Although outnumbered better than two-to-one, the Pacific Fleet carriers immediately went on the offensive, albeit limited.

At dawn on February 1, 1942, aircraft from the *Enterprise* struck Kwajalein, Maloelap and Wotje Atolls in the Marshall Islands, sinking two ships and damaging others. Concurrently aircraft from the *Yorktown* (which was rushed into the Pacific) struck the Southern Marshalls atolls of Jaluit, Makin and Mili. A strike planned for late February against Rabaul was cancelled after the *Lexington* was detected, however the task force indicted grievous losses on attacking enemy aircraft with little damage. In the succeeding weeks aircraft from *Enterprise* hit Wake and Marcus, then joined with the *Yorktown* to attack Lae and Salamua, New Guinea. (See "The Long Winter," March/April 1992 *Yankee Wings*.) A month later B-25 bombers operating from the *Hornet* shocked the world in the daring raid on Tokyo. These operations all occurred in the five months following the Pearl Harbor attack, and under the leadership of several outstanding officers who would later guide the U.S. Navy's march across the Central Pacific.

Nimitz

In the aftermath of Pearl Harbor, ex-battleship officer Chester Nimitz was assigned as Commander-in-Chief of the Pacific Fleet. His shrewd strategic judgement prior to the battles in the Coral Sea and at Midway made the difference between victory and defeat. Strategically these two battles resulted in the U.S. Navy's carrier strength becoming equal with that of the Imperial Navy. An affable, somewhat easy-going officer, Nimitz had his differences with Army General Douglas MacArthur, who commanded army and navy forces in the Southwest Pacific. MacArthur wanted the navy to go through the Southwest Pacific to cut off the Japanese from their sources of raw materials, especially the East Indies oil and Malayan rubber. Nimitz successfully argued that the Navy would be better used in the open Pacific, rather than in the relatively-narrow waters commanded by MacArthur. After thorough staff study, the Joint Chiefs of Staff decided on a dual plan across the Pacific to Japan.

The thrust through the Central Pacific was unique in the annals of warfare. It required new training



USS Hornet

methods and new techniques of combat, support, supply and maintenance, and an arsenal of new weapons. The latter was embodied in the U.S. Fifth Fleet, organized in 1943 for the purpose of projecting power at a distance. This has become the role of the aircraft carrier ever since. By autumn 1943 there were in the Fifth Fleet six predominantly *Essex*-class heavy and five 11,000-ton *Independence*-class light carriers, eight escort carriers, five new and seven old battleships, nine heavy and five light cruisers, 56 destroyers, 29 transport and cargo ships and a large number of landing and beaching craft.

Spruance

Commanding the Fifth Fleet was Vice Admiral Raymond A. Spruance. His pre-war work on the staff of the Naval War College had earned him a reputation as a strategist. Nicknamed "Electric Brain" because of his tactical brilliance, Spruance proved that he understood carrier tactics during his performance at Midway. Since then, as Admiral Nimitz's chief of staff, he had had a major input in planning the operations he was to lead.

Halsey

Admiral William Halsey was a destroyer officer in the 1930s, who became interested in naval aviation and qualified as a pilot in 1935 at the age of 52. Dubbed "Bull" by the press for his aggressive command of the task force which launched Doolittle's bombers toward Japan, he lived up to the image. His slogan, "Kill Japs, Kill Japs, Kill More Japs!" was emblazoned on barracks and buildings all over the Pacific. He also decreed, "My ambition is to populate Hell with the yellow bastards." Halsey was not averse to risk. In the 1944 Battle of Leyte Gulf, he swallowed the Japanese bait, and allowed his carrier force to be lured away from the landing beaches he had been ordered to protect. As he was bearing down on the decoy force

Admiral Marc Mitscher gave the famous command "Turn off the lights" during the Battle of the Philippine Sea. (USN)

of enemy carriers (which had been stripped of their aircraft because of a pilot shortage) a contingent of Japanese battleships slipped in behind him and threatened to annihilate the vulnerable landing support forces. A few weeks later he exposed his task force to a typhoon, and refused to authorize ships which were low on fuel to ballast, because the sea water would contaminate their fuel tanks, requiring them to return to a rear area to have them cleaned. As a result three destroyers capsized with the loss of over 800 men. A formal Navy Court of Inquiry found him guilty of "errors of judgement." He remained in command, however, and in March 1945 was awarded the Distinguished Service Medal for his services in command of carrier task forces supporting the island offensive in the Pacific.

Mitscher

Admiral Marc Mitscher was one of the first officers to specialize in aviation. He became the Navy's 33rd pilot in 1916, and was the Commanding Officer of *Hornet* during the Doolittle Raid. In December 1943 he assumed command of Task Force 58, which hounded the enemy all the way back to Tokyo. He was awarded three Distinguished Service Medals, and after the war was promoted to full admiral.

American victories in the Battles of the Coral Sea and Midway were not achieved without loss, however. *Lexington* was sunk in the former, and the *Yorktown* went down in the latter. In August 1942 the *Saratoga* was torpedoed and returned to the Bremerton, Washington shipyard for repairs. In mid-September *Wasp* was sunk by the Japanese submarine I-19 in the Coral Sea, and five weeks later *Hornet* was lost in the Battle of Santa Cruz. Until the *Saratoga* was repaired, the "Big E" by itself would constitute American carrier air power in the Pacific. Even when the *Sara* returned in early 1943, Halsey was forced to carefully husband his carrier force, because the *Enterprise* had sustained so much battle damage that her readiness was questionable. Conditions were so critical that negotiations with the Royal Navy resulted in the assignment of *HMS Victorious* temporarily to Halsey's command. On May 17, 1943, as the "Vic" joined *Saratoga* at Noumea, *Enterprise* entered Pearl Harbor for much-needed repairs. And when *Victorious* returned to Pearl three months later, she was greeted by a brand-new warship: the *USS Essex (CV-9)* had entered the war.

Enter the *Essex*

The *Essex*-class carriers were state-of-the-art, and they formed the backbone of the fast carrier task forces. They were big – some 880 feet long, with a crew ranging between 2,900 and 3,500 – and their fully-loaded displacement averaged 33,000 tons. They had a range of 17,000 miles at 20 knots, and a top speed of 33 knots. They carried 2-3 inches of side armor, 1-1/2 inches in the flight deck and upper decks, and 3 inches under the hangar deck. Defensive armament included 12 radar-guided 5-inch guns; 44 to 72 40mm guns and 52 guns of 20mm caliber. They carried 6,300 tons of fuel oil, and 690 tons of aviation gas, as well as 320 tons of ship and aviation ordnance. Each ship, less its air group, cost an average of $38 million. The air group consisted of

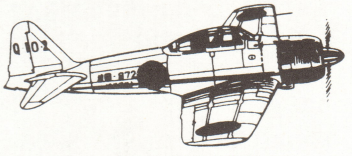
82 to 100 aircraft (although up to 108 aircraft were sometimes embarked), comprised primarily of Grumman TBF "Avenger" torpedo bombers and F6F "Hellcat" fighters, Chance Vought F-4U "Corsair" fighters and Curtiss SB2C "Helldiver" dive bombers.

A total of 19 *Essex*-class carriers were ordered. The namesake, *Essex*, was launched on December 31, 1942, and completed five months later. By this time, carrier losses during 1942 had resulted in the renaming of some of the original ships. Consequently, *Bon Homme Richard* became *Yorktown (CV-10)*, which was completed in 1943. (Another hull was completed as the *USS Bon Homme (CV-31)* the following year.) Other ships in the class of '43 included *Intrepid (CV-11)*, *Hornet (CV-12)* which was originally *Kearsarge*, *Randolph (CV-15)*, *Lexington (CV-16)* which had been *Cabot*, *Bunker Hill (CV-17)* , and *Wasp (CV-18)* which had been *Oriskany*. 1944 saw the completion of *Franklin (CV-13)*, *Hancock* became *Ticonderoga (CV-14)*, *Ticonderoga* became *Hancock (CV-19)*, and *Bennington (CV-20)*. The *USS Boxer (CV-21)* was completed in 1945. Other ships in the class were completed late or after World War II, and/or did not serve in the Pacific. Ships were not always completed in sequence as the total construction time varied. While most were built in 17-1/2 months, *Franklin* was finished in a record 14-1/2 months.

Advent of the Fast Carrier Task Force – 1943

Behind the big *Essex*-class carriers, the U.S. Navy's Pacific offensive accelerated into high gear. It was fitting that new tactics be designed for the new carriers and air groups. Until now the U.S. Navy had operated primarily in single-carrier units, i.e., one carrier and its escort ships. Consensus was growing among carrier skippers and commanders, however, for placing several within the same screen of escort vessels. This would improve efficiencies in launching and recovering strikes, as well as provide Combat Air Patrols for the entire force. There was also the need to bring all carrier task-force (CTF) operations to a uniform standard of excellence. To this end, Nimitz agreed to a period of combat sorties (dubbed "makee learn") against isolated targets in order to hone the CTF's tactics and fighting skills.

The first target was Marcus Atoll, which Halsey had hit a year earlier. Now it would be savaged by the combined air power from *Essex*, *Lexington* and *Independence (CVL-22)*, on August 31, 1943. Less than three weeks late (September 18-19) *Lexington* led the light carriers *Princeton (CVL-23)* and *Belleau Wood (CVL-24)* in strikes against Tarawa to destroy enemy aircraft and to get low-level reconnaissance photos of the beaches. Ten days later, six carriers sortied from Pearl Harbor in the largest carrier force yet assembled by the U.S. Navy. The target was Wake Island, which was worked over on October 5-6. When the CTF returned to Pearl, Admiral Nimitz declared an end to "makee learn" – the assault on Tarawa was imminent, and it was time to prepare for it. But the gods of war intervened.

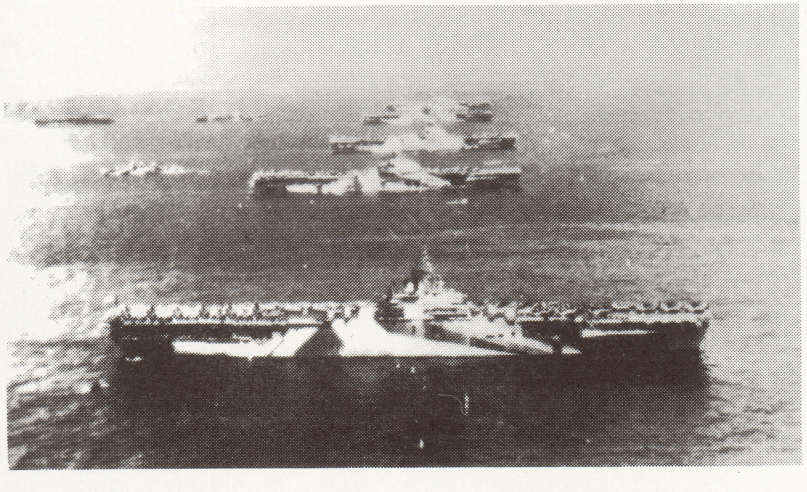


Zero Type 32

Rabaul Interlude

During the period of "makee learn" Admiral Mineichi Koga, Japan's new Combined Fleet Commander, pondered his adversary's next move. As a disciple of the late Admiral Yamamoto (see *Yankee Wings*, March/April 1993), Koga embraced the strategy of winning the One Big Battle. With American strength growing daily, he wanted a decisive victory as soon as possible. In mid-October he sortied his three available carriers, but nothing developed. To the south Halsey was providing naval support for MacArthur's advance up the Solomon chain. In an effort to force the decisive battle there, Koga ordered to Rabaul all available carrier aircraft. Combined with the planes already there, he had some 375 aircraft with which he hoped to give Halsey's carrier-shy Third Fleet a bloody nose. Independently, however, Halsey had already asked Nimitz for the loan of two CTFs to support the Bougainville landings. Koga, in response, poured more ships and aircraft into Rabaul – making it a juicy target.

On November 5, the U.S. Navy hit Rabaul in a textbook attack that damaged five cruisers, one seri-



"Murderers' Row"
A line-up of *Essex*-class carriers at a Pacific anchorage, with *USS Essex (CV-9)* in foreground. Dapple camouflage was intended to confuse enemy pilots and submarine skippers as to the ship's movement. (Nat'l. Archives)

ously, and forced Koga to abort his planned attack. A follow-up attack left two destroyers sinking. Heavy losses in aircraft forced Koga to recall the remnants of his carrier air groups, which had lost 121 of the 173 aircraft deployed, as well as 86 of their 192 highly-trained aircrew. They would be sorely missed in the months ahead.

Dual Advance to the Philippines – 1944

For the re-conquest of the Gilbert and Marshall Islands, Nimitz envisioned the carrier's role as two-fold: close support of the amphibious forces, and strategic defense against any appearance of the Japanese Combined Fleet. In November 1943, U.S. forces captured Tarawa, Makin and Abemama in the Gilberts, and in January - February 1944 they assaulted Kwajalein, Roi and Namur in the Marshalls. Not only was there virtually no opposition by the Combined Fleet, but Koga withdrew much of his fleet from Truk, leaving only two cruisers and eight destroyers plus nearly 400 aircraft to protect the cargo vessels there. In mid-February TF 58 simultaneously supported landings on Eniwetok and hit Truk, destroying the latter's reputation for impregnability along with 15 ships and about 200 aircraft.

In early March the Joint Chiefs of Staff set the time-table for the rest of the dual advance across the Pacific. While MacArthur's forces moved along the north coast of New Guinea, the Central Pacific forces would take Saipan, Tinian and Guam in the Marianas starting in June. In September they would assault the Palaus, and subsequently provide support for MacArthur's invasion of the Philippines. These operations triggered the last two great carrier battles of the Pacific War.

By June Admiral Soemu Toyoda had assumed command of the Combined Fleet. While still pursuing the One Big Battle strategy, his carrier forces were considerably

The Chance Vought F4U Corsair was an outstanding fighter as well as a fighter-bomber. This example carries a 1,000-pound bomb on the centerline station. (Vought)

weakened by a lack of fuel and trained pilots. When the carrier-centered First Mobile Fleet sortied under Admiral Ozawa, the air groups contained a large number of minimally-trained pilots. In the Battle of the Philippine Sea on June 19, Ozawa saw his carrier aircraft reduced from 430 to an even hundred in what has been call the "Great Marianas Turkey Shoot." *Essex* Hellcat pilot LT. Alexander Vraciu downed six enemy aircraft in less than five minutes.

The following day U.S. aviators struck Ozawa's fleet at sunset, sinking a carrier and two tankers and damaging four more warships. As the American aircraft returned after darkness, Admiral Mitscher weighed the risk of attacks by enemy aircraft and/or submarines and ordered, "Turn on the lights." Ships turned on deck and running lights, while five-inch guns fired star shells, and searchlights pointed straight upward as homing beacons. Of the 216 aircraft launched, 20 were lost in combat, and another 80 ditched at sea, but over 100 aircraft were recovered. Of the 209 aviators who had participated, all but 49 returned.

The last carrier-vs-carrier battle was the Battle of Leyte Gulf (see "The Battle of Bull's Run" on page 10). By this time the Japanese suicide planes of Kamikazes ("Divine Wind") had begun to take a toll of warships in the waters around the Philippines. In mid-December Captain John S. "Jimmy" Thach developed a new tactic to counter the threat. Dubbed the "Big Blue Blanket" after the dark blue color scheme of late-war aircraft, it provided for almost continuous air cover over enemy airfields during daylight hours while another flight was readied aboard the carriers and a third strike was enroute to or from the target area. Nevertheless, some of the worst damage of the war was inflicted by the Kamikazes. Between October 1944 and July 1945 three escort carriers were sunk and 28 carriers were damaged, with a total of 3,253 fatalities. Altogether a total of 474 American ships were hit.

Going Through Hell

Intrepid had the unlucky penchant for collecting Japanese bombs and torpedoes, earning her the sobriquet, "The Evil I." She was first hit off Truk in February 1944. While her aircraft aided in sinking the *Musashi* off the Philippines later that year, *Intrepid* was victimized with seven bombs, five Kamikazes, and a torpedo, which put her out of action for four months. During this action the Evil I's gunnery officer cried out, "For God's sake, are we the only ship in the ocean?" *Intrepid* would suffer yet another attack off Okinawa the following year.

The *Franklin* sailed into battle at

"The Big Blue Blanket"
Grumman F6F-3 Hellcats; The Hellcat was the most successful U.S.-built, carrier-based fighter type, accounting for 5,156 enemy aircraft. (USN)

Leyte Gulf, where her aircraft aided in sinking one of Japan's largest battleships, the *Musashi*. She was part of Task Force 58 when its planes sank the carriers *Chiyoda* and *Zuikaku*. *Franklin* was damaged by Kamikazes, and retired to the Bremerton Navy Yard for repairs. After rejoining the fleet, she was struck by two bombs on March 18, 1945. The attack and resulting fires killed 724 crewmen, and wounded another 265. Thanks to excellent damage control, the fires were extinguished and *Franklin* limped halfway around the world to New York City. She never returned to the war.

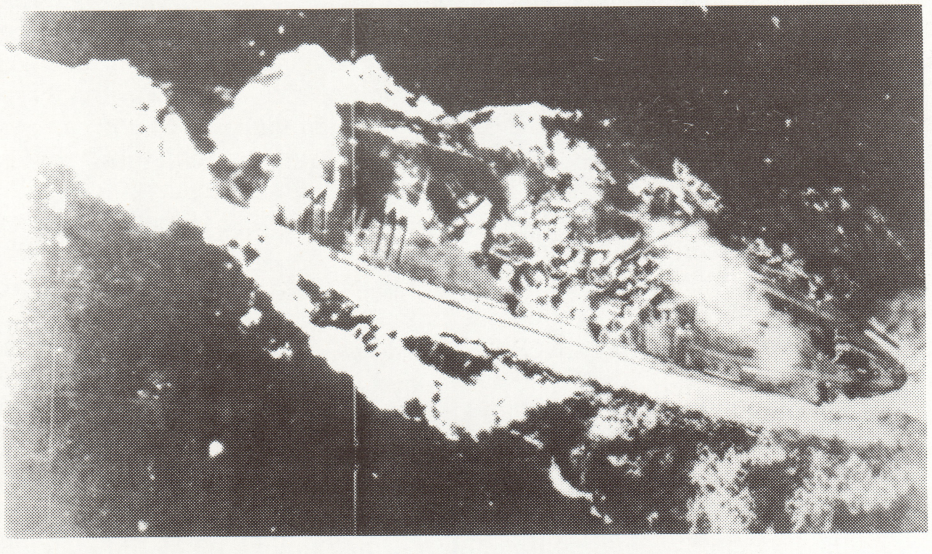
Bunker Hill conducted operations against Truk and participated in the "Marianas Turkey Shoot" in June 1944. Serving with Task Force 58, her aircraft helped sink the superbattleship, *Yamato*. On May 11, 1945 off Okinawa, two Kamikazes ravaged the *Bunker Hill*. The ship burst into flames, which burned for 24 hours consuming three decks and most of her length. To control the flames her captain ordered violent course changes which threw her burning airplanes into the sea. The inferno cost 660 lives. No other flattop went through such a hell except the *Franklin*. The *Bunker Hill's* survival was due to the discipline, skill and training of her damage control parties and her compartmental construction. She was repaired in time to repatriate troops at the end of the war. *Bunker Hill* won eleven battle stars – a feat equalled only by the *Essex*, *Hornet*, and *Enterprise*.

Off Okinawa in March 1945, *Wasp* was also attacked by Kamikazes, but bravely continued flight operations despite the damage. She missed the surrender in Tokyo Bay when she sailed home for repairs after the battle. Less than three weeks later, the Imperial Navy launched the largest suicide operation in history.

Yamato's Death Cruise

On April 6, 1945, the superbattleship *Yamato* sortied from the Inland Sea with light cruiser *Yahagi* and eight destroyers for an escort. With fuel for a one-way journey, and only five-days' rations, she was intended to beach herself off Okinawa, where her guns could provide support for the army. The Japanese literally worshipped the *Yamato*, which was the original name for ancient Japan. She was the world's largest warship, displacing some 73,000 tons fully-loaded. Her main battery consisted of nine 18.1-inch guns, and the secondary battery included 150 antiaircraft and machine guns. Commissioned in 1941, she had been the flagship of the Combined Fleet commander at Midway, the Philippine Sea and Leyte Gulf.

U.S. submarines sighted the force and flashed a warning. Spruance decided to use his battleships against her, but Mitscher jumped the gun on Spruance. In a classic Wagnerian drama, Naval aviation reached her first. Shortly before



A bomb explodes on the foredeck of the Japanese superbattleship *Yamato*, as she enters her death throes, April 7, 1945. (USN)

noon on April 7, the first of the 386-plane strike force arrived. When they were finished *Yamato*, *Yahagi* and four destroyers lay on the bottom, in exchange for 10 aircraft and 12 aircrewmen.

Without a question, the capitol ship was now the aircraft carrier. Naval historian Clark Reynolds aptly commented: "If the shift of power from once-mighty dreadnoughts to aircraft carriers needed a final chapter, it was written that afternoon as the *Yamato* went down." The dean of WWII naval historians, Samuel Eliot Morrison judged: "When she went down, five centuries of naval warfare ended."

Soon carrier forces operated off the Japanese home islands, bombing and strafing. Even before the atomic bombs were dropped, "Japan was beaten, and carrier supremacy defeated her," observed Admiral Mitscher. One naval historian added, "One could go further and say that had not the atom bomb been dropped on Hiroshima and Nagasaki, the fast carrier task forces acting in support of not only round-the-clock aerial bombing, but also of aerial and submarine minelaying, could have brought Japan to surrender within three months."

Last Operation

Despite Japan's announcement of capitulation in 1945, Admiral Halsey cautiously issued the order: "THE WAR WITH JAPAN WILL END AT 1200 ON 15TH AUGUST. IT IS UNLIKELY THAT KAMIKAZES WILL ATTACK THE FLEET AFTER THIS TIME AS A FINAL FLING. ANY EX-ENEMY AIRCRAFT ATTACKING THE FLEET IS TO BE SHOT DOWN IN A FRIENDLY MANNER." The final carrier operation of the Pacific War was *Operation Tintype*, a fly-by of 1,000 carrier planes over Tokyo Bay on August 22, 1945.

By the end of 1947, fourteen of the eventual twenty-four ships in the class lay in mothballs, followed by three more in 1949. Contingencies of the Cold War, however, prompted their recall to active duty, classified first as attack carriers (CVA), and subsequently as anti-submarine carriers (CVS). A few were ultimately employed as helicopter carriers (LPH) or aircraft transport auxiliaries (AVT) (see box below), but this is another story. By the mid-seventies their useful life was over, except for one. The *Lexington* soldiered on as the training carrier (CVT) at Pensacola until she was relieved in 1992 by the *USS Forrestal (CVA-59)*. The "Lady Lex" is now enshrined as a floating museum at Corpus Christi, Texas. Two of her sisters also escaped the cutting torch: *Intrepid* is a museum off Manhattan Island, and *Yorktown* is the pride of Patriots' Point outside of Charleston, South Carolina. ✪

Essex-Class Carriers

Ship Name	Keel Laid	Date Commissioned	Date Decommissioned*	Reclassified #
Essex (CV-9)	4/28/41	12/31/42	6/30/69	CVA,CVS
Yorktown (CV-10)	12/1/41	4/15/43	6/27/70	CVA,CVS
Intrepid (CV-11)	12/1/41	8/16/43	3/30/74	CVA,CVS
Hornet (CV-12)	8/3/42	11/29/43	6/26/70	CVA,CVS
Franklin (CV-13)	12/7/42	1/31/44	2/17/47	CVA,CVS, AVT-8@
Ticonderoga (CV-14)	2/1/43	5/8/44	9/1/73	CVA,CVS
Randolph (CV-15)	5/10/43	10/9/44	2/13/69	CVA,CVS
Lexington (CV-16)	9/15/41	2/17/43	11/8/91	CVA,CVS,CVT
Bunker Hill (CV-17)	9/15/41	5/25/43	2/17/47	CVA,CVS AVT-9@
Wasp (CV-18)	3/18/42	11/24/43	7/1/72	CVA,CVS
Hancock (CV-19)	1/26/43	4/15/44	1/30/76	CVA
Bennington (CV-20)	12/15/42	8/6/44	1/15/70	CVA,CVS
Boxer (CV-21)	9/13/43	4/16/45	12/1/69	CVA,CVS, LPH-4
Bon Homme Richard (CV-31)	2/1/43	11/26/44	7/2/71	CVA
Leyte (CV-32)	2/21/44	4/11/46	5/15/59	CVA,CVS, AVT-10
Kearsarge (CV-33)	5/1/44	3/2/46	2/13/70	CVA,CVS
Oriskany (CV-34)	5/1/44	9/25/50	9/30/76	CVA
Antietam (CV-36)	3/15/43	1/28/45	5/8/63	CVA,CVS
Princeton (CV-37)	9/14/43	11/18/45	1/30/70	CVA,CVS LPH-5
Shangri-La (CV-38)	1/15/43	9/15/44	7/30/71	CVA,CVS
Lake Champlain (CV-39)	3/15/43	6/3/45	5/2/66	CVA,CVS
Tarawa (CV-40)	3/1/44	12/8/45	5/13/60	CVA,CVS, AVT-12
Valley Forge (CV-45)	9/7/44	11/3/46	1/15/70	CVA,CVS, LPH-8
Philippine Sea (CV-47)	8/19/44	5/11/46	12/1/69	CVA,CVS

* Indicates most recent date (some ships were decommissioned and recommissioned)

\# After WWII all ships in the class were reclassified one or more times. @ denotes ships which were reclassified while still in inactive status

Source: Pawlowski, Gareth L.; *Flat-Tops and Fledglings*; (Castle Books - New York, NY); 1971

The Battle of Bull's Run

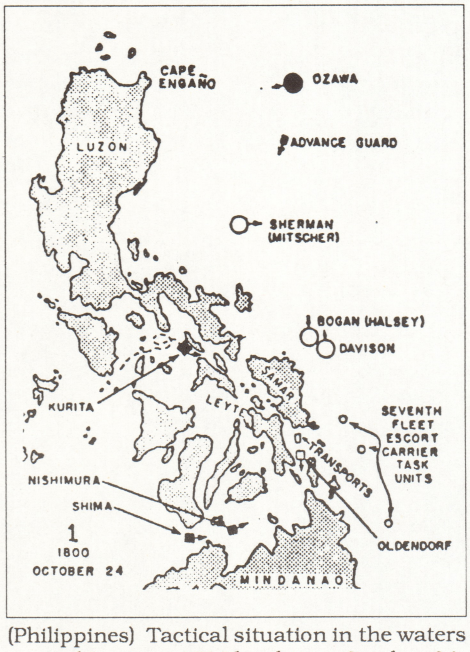
by Jim Hanford

The Battle for Leyte Gulf, which resulted from the American invasion of the Philippines, was not only the most complex naval engagement in history, but it was also full of ironies. It lasted four days, and was actually a series of battles fought hundreds of miles apart. Its complexity resulted from four different Japanese forces and two powerful American fleets converging on the same point in time and space – Leyte Gulf.

Although the operation at Leyte combined the American Central Pacific (Nimitz) and Southwest Pacific (MacArthur) forces together in a single operation, there was no provision for an over-all commander at the scene. The assault forces, which were part of Admiral Kinkaid's Seventh Fleet, were to be supported by Halsey's Third Fleet. Unfortunately the two commanders had sharply different conceptions regarding their specific missions. Kinkaid's task was to land and support the amphibious forces, and his weapons loads reflected that mission. Thus the Seventh Fleet was ill-prepared to fight a naval action.

By comparison Halsey had the fast carrier task force and a generous complement of big-gun ships to run interference. He also had direction from Admiral Nimitz, back in Pearl Harbor, to seek out and destroy a major portion of the enemy fleet if the opportunity presented itself. When four opportunities were presented, Halsey chose the one he thought contained the greatest risk – the Japanese fast carrier force.

In any event, his decisions were both right and wrong. While he positioned his ships as a blocking force to the north, the direction from which the enemy carrier threat was expected, the Japanese big-gun ships were converging on the beach head from the south and the northwest. Their plan assigned their carriers, which lacked sufficient pilots and aircraft to put up a good fight, to act as a decoy under Admiral Ozawa and draw the enemy's carriers away from the vulnerable Allied transports. Kinkaid dispatched his battleships to deal with the southern threat, and during the night of October 24-25, 1944 they won a stunning victory in the Battle of Surigao Strait.



(Philippines) Tactical situation in the waters around Leyte at 6PM local time October 24, 1944. Japanese Southern Forces under Admirals Nishimura and Shima are hours away from defeat by Olendorf's surface forces in the Surigao Strait. Kurita is recovering from TF-38 air attacks, and shortly would set course around Samar to attack the transports in Leyte Gulf soon after dawn. Task groups under Bogan (with Halsey embarked), Sherman and Davison included the battleships that Halsey had designated as TF-34, but which would head north during the night to attack Ozawa'a carriers.

Simultaneously, Halsey amassed his air forces against Admiral Kurita's Center Force, which was heading toward the San Bernardino Strait. In the ensuing actions, all of Kurita's battleships were hit and the super battleship Musashi was sunk. At this point Kurita changed course to withdraw. Halsey then radioed that, if Kurita's forces returned, he would detach four battleships, including his flagship New Jersey, with six cruisers and fourteen destroyers as Task Force 34, to seal off the San Bernardino Strait. Though not an addressee, Kinkaid intercepted Halsey's message and assumed that he would carry out "...a perfect battle plan."

Halsey, however, was more concerned about the absence of the enemy's carriers. Late on the 24th his scout bombers found Ozawa some 300 miles to the north. This posed a quandry: to remain off San Bernardino Strait or pursue the enemy carriers? Halsey correctly judged the Southern Force was spent and, based upon his pilots' reports that the Center Force had been mauled, he set course toward the greatest threat. He was due for a series of shocks the following day.

During the night Kurita again reversed course and, in the dark early hours of October 25th, he exited San Bernardino Strait to pounce on Kinkaid's escort carriers. By this time Halsey and Task Force 34 were actually leading the fast carrier groups on a closing course toward Ozawa. When Kinkaid asked if TF 34 was guarding the strait, Halsey replied: "NEGATIVE. TF 34 IS WITH CARRIER GROUPS

NOW ENGAGING ENEMY CARRIER FORCE." Shortly thereafter Halsey received frantic calls for help from RADM. Sprague, commanding one of the escort groups under attack by Kurita's battleships.

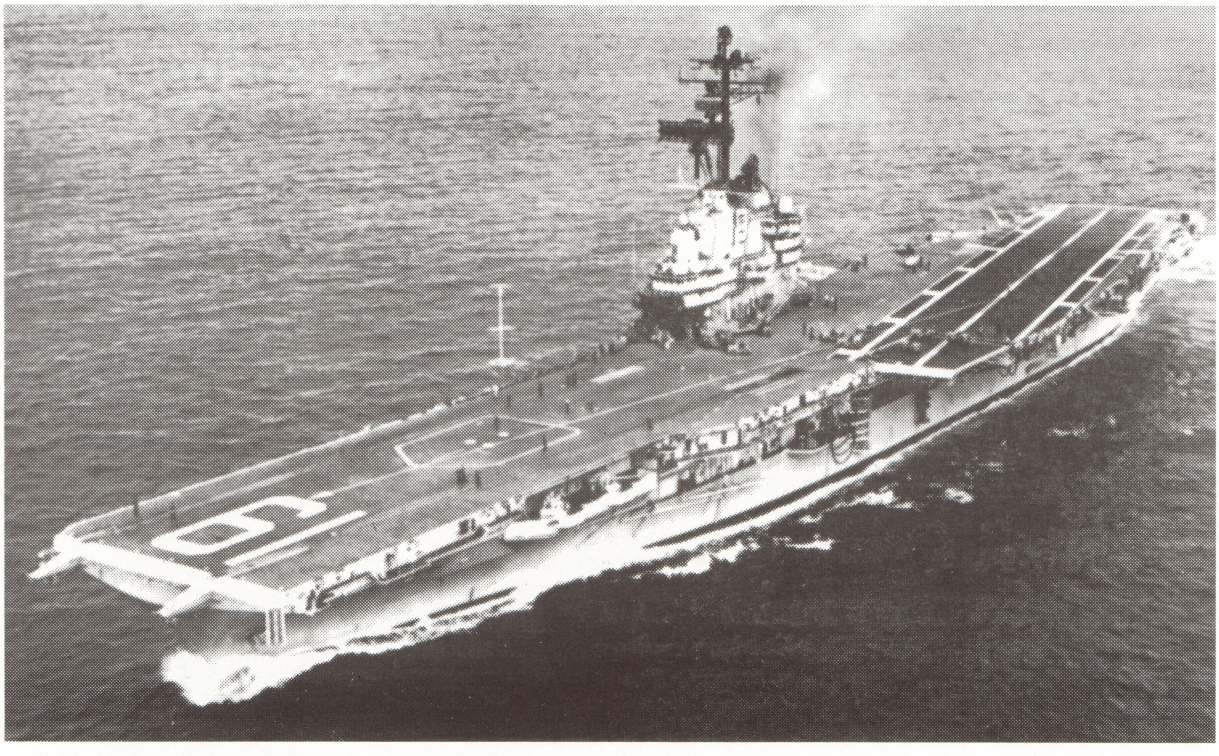
Still Halsey was not alarmed. He thought that Kinkaid had enough aircraft to protect his forces. Ironically Kurita also heard the desperate, plain-language message. Assuming his force was about to be hammered by Halsey's fast carriers, he broke off action and ran for the San Bernardino Strait, having sunk an escort carrier and three destroyers. At last Nimitz, who had followed the exchange of communications, felt compelled to intervene. He sent Halsey a sharp and laconic message: "Where is, repeat where is, Task Force 34?"

Halsey's aircraft had already launched two strikes on Ozawa's carriers when he received the dispatch, which appeared to be insulting: "FROM CINCPAC [Nimitz] ACTION COM THIRD FLEET [Halsey] INFO COMINCH [King] CTF SEVENTY SEVEN [Kinkaid} X WHERE IS RPT WHERE IS TASK FORCE THIRTY FOUR RR ALL THE WORLD WONDERS." Halsey was enraged. To all appearances his immediate boss had publicly upbraided him before not only his contemporary, but also the Navy's top man, Admiral King. In reality, he was the victim of a cruel set of circumstances.

To protect such short messages from possible crypto-analysis, unrelated text called *padding* was added by the originator's cryptographers before and after the actual text. The ensign at Pearl Harbor who encrypted the message dutifully complied, but erred in selecting a phrase which could be interpreted as part of the text. On the *New Jersey*, the communicators had orders that when urgent messages arrived, they were to take the decode tape directly from the crypto machine to Admiral Halsey or his Chief of Staff – *after first tearing off the padding.* The dispatch's opening phrase, "THE TURKEY TROTS TO WATER," was obviously padding and was separated. The closing phrase, however, from Tennyson's *Charge of the Light Brigade*, was so plausible that the communicators decided not to remove it.

Within the hour, Halsey made a decision he later regretted – he ordered TF 34 to reverse course and head toward Leyte Gulf. "At that moment," he recalled, "the Northern Force, with its two remaining carriers crippled and dead in the water, was exactly 42 miles from the muzzles of my 16-inch guns... I turned my back on the opportunity I had dreamed of since my days as a cadet. For me, one of the biggest battles of the war was off, and what has been called the "Battle of Bull's Run" was on."

In his absence Halsey's carriers continued their attacks and sunk all four of Ozawa's carriers, including *Zuikaku*, the last surviving Pearl Harbor attacker. Ozawa then broke off the action and returned to Japan minus his carriers, but with 10 of his 13 surface vessels intact. His decoy mission had succeeded beyond his best expectations. He not only had saved Kurita from annihilation, but had extricated a good part of his own suicide force as well. Yet the Japanese failed to realize the ultimate object of Ozawa's suicide mission because he was unable to establish radio communication with Kurita, who subsequently aborted his attack just as he was on the verge of success. ✪

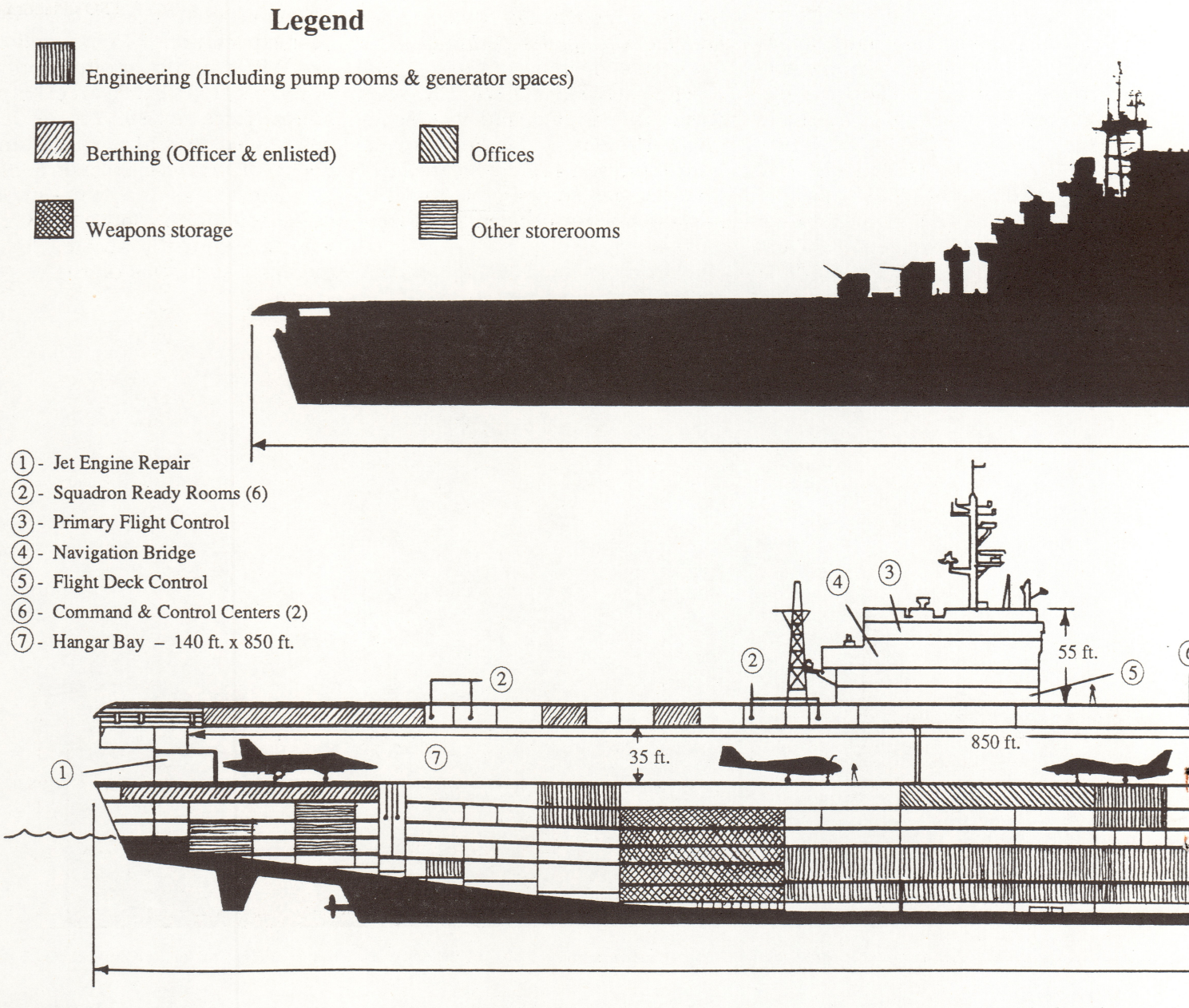


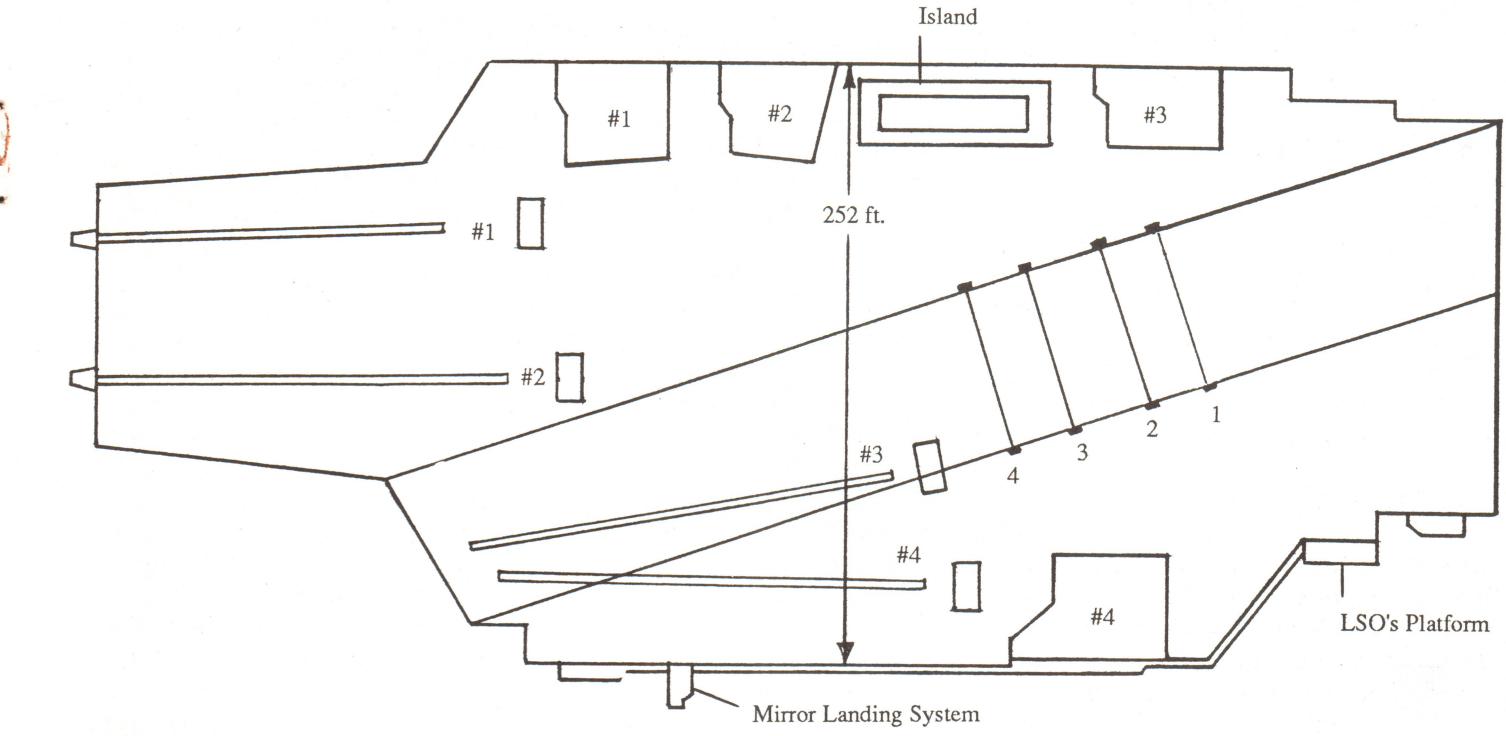
USS Hancock (CV-19) as she appeared after her major conversion in 1956. (USN) See related story, The Carrier Revolution, on page 15.

The Anatomy of an Aircraft Carrier

On these pages artist **Gary Redfern** has graphically portrayed the innards of a modern attack aircraft carrier, the *USS America (CVA-66)*. Because of space limitations, he was able to show only the most salient features. Many others, such as officer and enlisted berthing areas, could only be shown by cross-shading and the generic term, "berthing." A waterline silhouette of the *USS Essex* is shown to the same scale for comparison.

Again because of space limitations, we resorted to an out-of-scale plan view in the upper right corner to depict the *America's* flight deck features. Shown in this schematic view are the four steam catapults with a hinged jet blast deflector astern of each, four deck-edge elevators, and the angled landing area with arresting wires and locations of the LSO and MLS. A set of similar drawings, but with far greater details may be found in a special fold-out in the February 28, 1994 issue of *U.S. News & World Report.*

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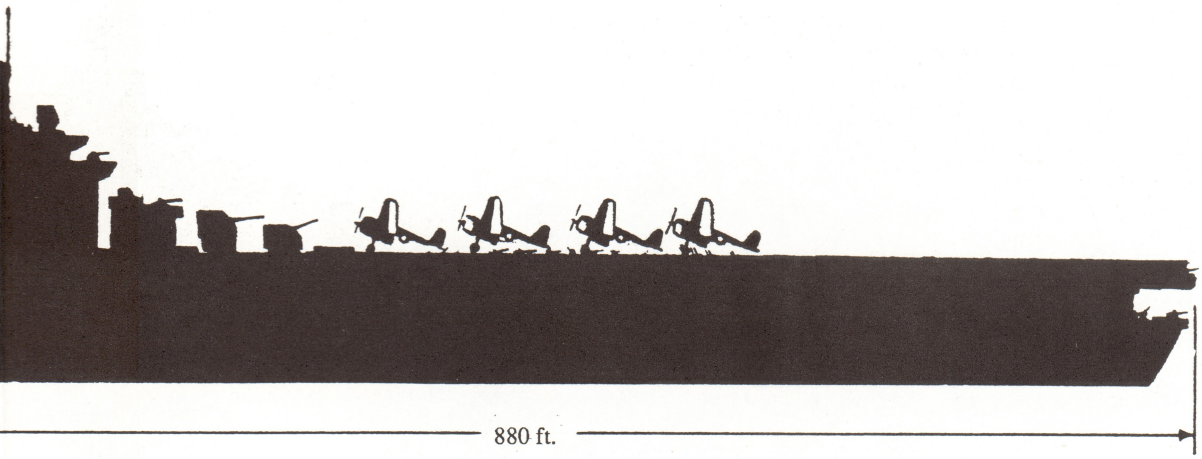
LSO's Platform
Mirror Landing System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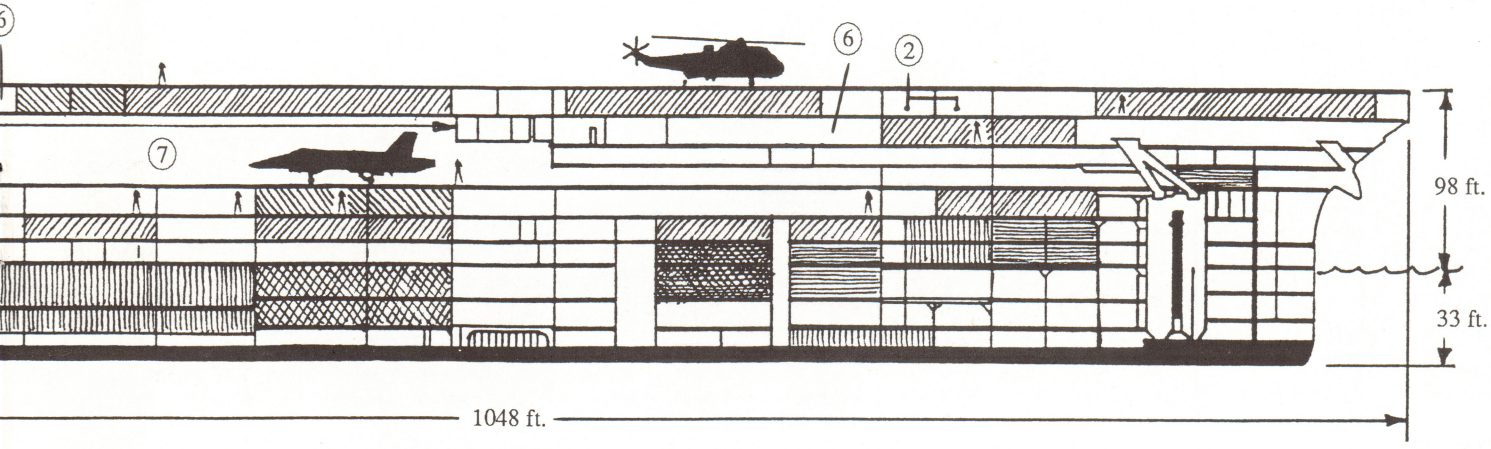
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TALE SPINS

by Jack B. Stankrauff

Bombing of Monte Cassino

Debate and controversy arose after World War II over the Allied bombing of the sixth-century monastery at Monte Cassino in 1944. Nearly two years of air and land battles constituted a major threat to Italy's historical buildings, museums, libraries, and ancient ruins.

Policy of Concern

In Washington, the Joint Chiefs of Staff were concerned about destruction of historic landmarks. Consequently, they organized the American Commission for the Protection and Salvage of Artistic Monuments in Europe, which President Franklin Roosevelt approved on August 20, 1943.

Headed by Supreme Court Justice Owen J. Roberts, this Commission included leading museum and religious officials as well as the Librarian of Congress, and was assisted by such cultural groups as the American Defense Harvard Group and the Committee of the American Council of Learned Societies on Protection of Cultural Treasures in War Areas. The Air Force cooperated by taking aerial photographs of historical areas of Italy and Europe and distributing the pictures to air and ground combat units. By April 1944, Commission workers had produced 160 city maps and seven area maps. Air Force planes were forbidden to bomb targets near historical areas obscured by clouds, fog or smoke.

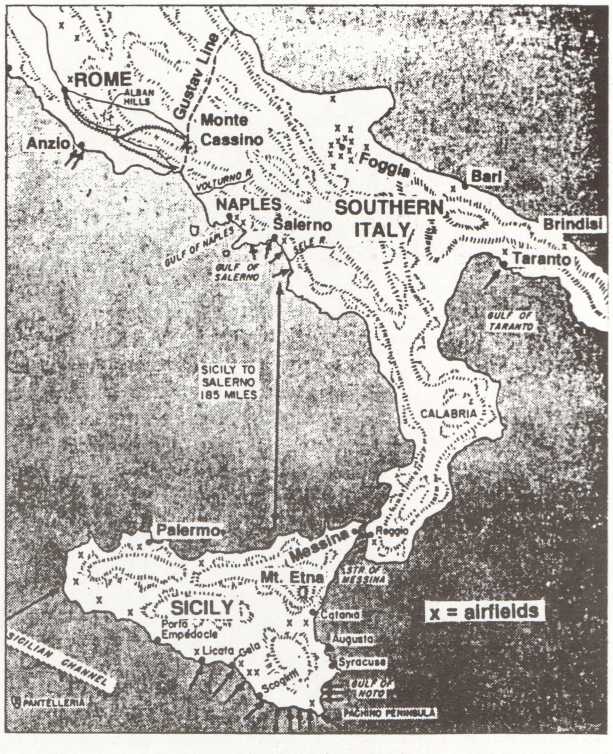
Cassino Considered Strategic

Allied ground forces struggled up through Italy toward Rome during 1943 and were stalemated at Cassino. The Benedictine monastery of Monte Cassino commanded the heights over the town of Cassino and the valley 75 miles south of Rome. On numerous occasions Allied ground forces attacking Cassino were repulsed. The mountains surrounding Cassino and areas close to the monastery were well-fortified and tenaciously held by German troops and artillery. Obviously, the question arose whether the monastery itself was being used by the Germans. It was the most logical site for an artillery observation post. British General Bernard Freyberg, commanding the ground forces around Cassino, wanted Monte Cassino bombed.

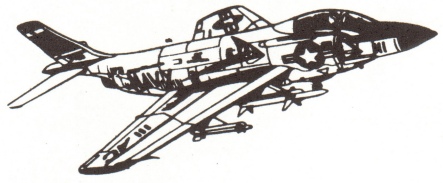
U.S. Air Force Generals Ira Eaker (Mediterranean Air Force commanding general) and his Deputy, General Jacob Devers, flew over the monastery to see for themselves. After their flight, Eaker said: "We clearly identified German soldiers and their radio masts. I could have dropped my binoculars into machine gun nests less than 50 feet from the [monastery] walls." Eaker and Devers reported their findings to General Mark Clark commanding the Fifth Army. General Clark sought permission from Mediterranean Theater commander, British General Harold Alexander, who reluctantly granted permission for Monte Cassino to be bombed.

On February 15, 1944, 255 Allied bombers struck the monastery along with thousands of shells fired from Allied artillery. The Germans held. One month later, over 560 bombers dropped 1,110 tons of bombs on Monte Cassino, and Allied artillery fired nearly 196,000 rounds into the monastery. Still the Germans stubbornly held on. They only withdrew from the monastery in May because their supply lines were severed by the same planes which could not drive them out of Monte Cassino. General Eaker said of the bombing missions: "Please be assured that we do everything possible to prevent wanton or careless destruction of these relics..." However, military necessity forced the missions.

Every effort was made by all Allied military commanders and their units to avoid destruction of cultural treasures during the Second World War. The morally-significant support by the United States military leaders of this concept, and the resulting American Commission for the Protection and Salvage of Artistic and Historic Monuments in Europe, allays the arguments and controversy surrounding the Monte Cassino bombings. ✪



(Italy) At its western end the Gustav Line ran along the high ground north of the Garigliano River. This forced the Allies into frontal assaults across the swiftly-flowing river while under constant enemy artillery fire directed, it was believed, from observation posts in the abbey atop Monte Cassino. Also shown are the numerous airfields on the plain around Foggia, from which the 15th Air Force (and several future YAF members) operated. Arrows indicate Allied amphibious assaults.



F3H-2 Demon

The Carrier Revolution

by Jim Hanford

"The aircraft turbojet engine revolutionized aviation forever. The increase in aircraft performance that it promised, even in its infancy, would literally shrink the planet Earth. But the turbojet engine had an even more revolutionary effect on military aviation. For the Navy, the big question... was whether jet aircraft could safely and effectively operate from aircraft carriers... If carrier aviation couldn't make the transition, aircraft carriers were dead!" – RADM. Paul T. Gillcrist in *Feet Wet.*

During the roughly fifteen years following World War II, Naval Aviation literally waged a fight for survival, and waged it simultaneously on several fronts. The political fight occurred within the Pentagon and the U.S. Congress. Dubbed "The Battle of the Admirals," it pitted Navy leaders against those of the fledgling Air Force for very scarce defense funding, during a time when all the services were forced to re-examine their very mission, and justify it. As interesting a story as this is, it is outside the scope of this article, which is limited to the development of naval jet aircraft and aircraft carriers.

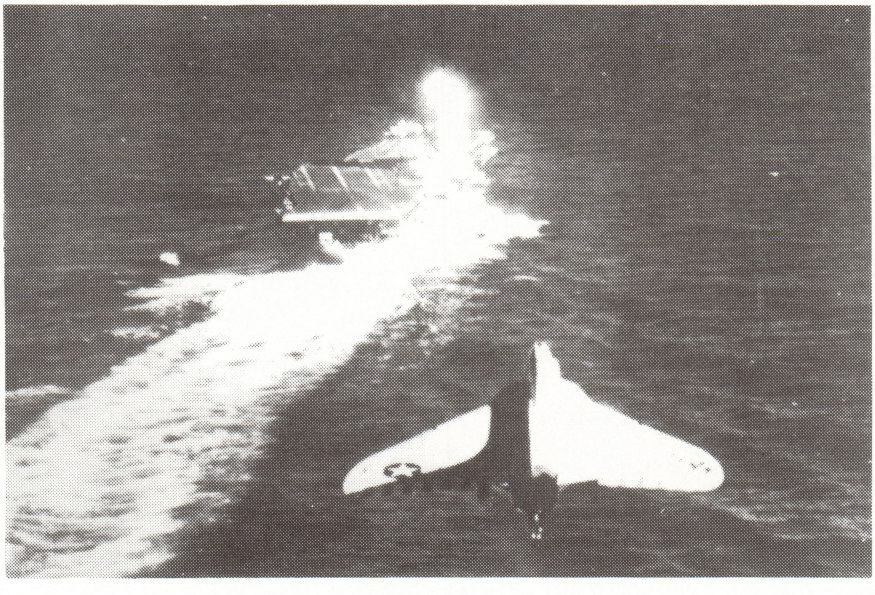
The "Golden Age of Carrier Aircraft Development"

Gillcrist roughly classified the development of jet aircraft in the U.S. Navy during this period into four phases. The "first generation" were all fighters, because of the limits of early jet engines, which were heavy and produced too little thrust per pound of engine. On the other hand, they provided good speed and high altitude capability, which are ideal for fighters. The first group of aircraft, however, such as the Grumman F9F Panther, the McDonnell FH-1 Phantom, and the North American FJ-1 Fury, all had straight wings, which limited their speed.

The "second generation" were primarily swept-wing variants of the above: the Grumman F9F-6 Cougar and the North American FJ-2/3 Furies, which began to deploy on carriers in 1952. They were, however, only capable of sub-sonic speeds. The "third generation" combined design innovations with afterburning engines to cross over the sound barrier. By the mid-1950s, aircraft like McDonnell's F-3H1 Demon, the Douglas F-4D Skyray, the Grumman F-11F1 Tiger and the Chance Vought F-7U Cutlass were passing through the initial testing and development phases. A trailing member of the third generation of fighters was the Chance Vought F-8U1 Crusader. By this time too, North American has cashed in with a bomber, the A-3D Skywarrior.

By now engine development was starting to catch up with the pace of airframe development, which ushered in the "fourth generation." Such magnificent engines as the General Electric J-79 in the McDonnell-Douglas F-4H1 Phantom II and the North American A-3JI Vigilante, and the Pratt and Whitney J-75, which powered the Ling-Temco-Vought F-8U3 Crusader II, gave naval aircraft the capability to exceed twice the speed of sound. This generation of fighters essentially shook out to one type: the F-4 Phantom II, which was the mainstay of USAF and USN airpower in Vietnam.

Improved aircraft alone, however, could not save carrier aviation. In fact, they tended to aggravate the



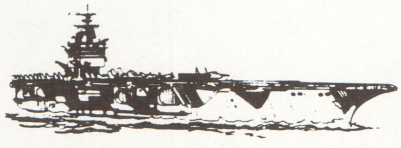
USS Essex reconfigured with an angled flight deck prepares to land an F4D Skyray in 1960. (USN)

problem arising from the forced co-existence of heavier, slower-response jet aircraft with the LSOs, straight decks and crash barriers. Jets not only land faster than their piston-engined counterparts, but the earlier generations suffered from a pronounced lag in throttle response. Simultaneously the additional time required for the pilot to acquire and react to the Landing Signal Officer with his paddles created an extremely dangerous situation. Three British innovations – the angled flight deck, the steam catapult, and the mirror landing system – saved the day for carrier aviation.

The Angled Deck

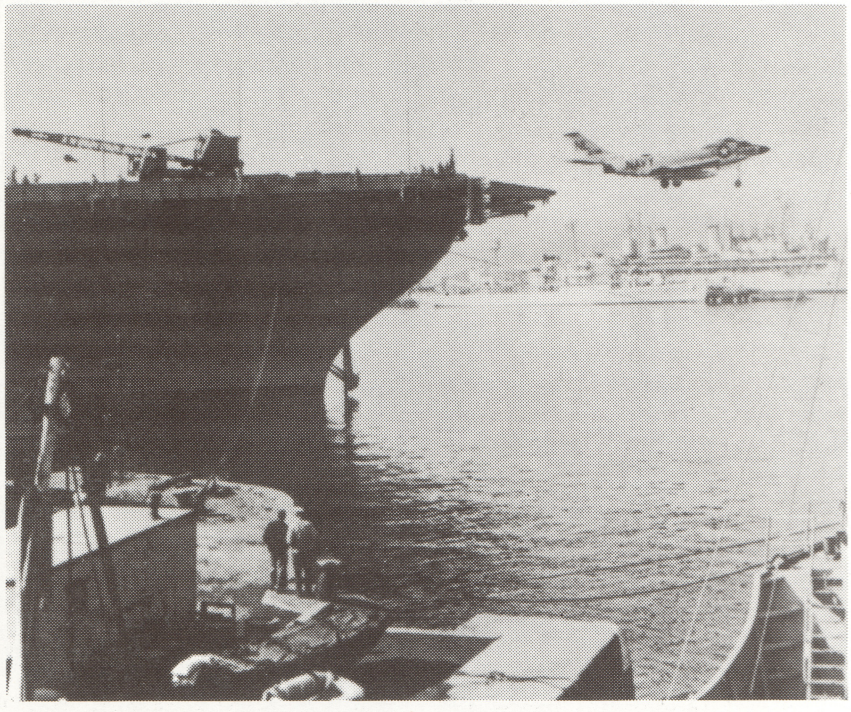
Of the three, the angled deck was clearly the most important. From the earliest days in the *USS Langley*, the crash barrier had been used to protect aircraft parked on the forward flight deck, while others landed over the stern. But the advent of heavier and very expensive jet aircraft rendered the former technique too costly to continue.

The startlingly simple solution was the angled deck. The brainchild of Captain D.R.F. Cooper, RN, was to angle the aircraft landing area several degrees from the ship's centerline, which allowed the forward flight deck to still be used for aircraft parking with an even higher degree of safety. Any pilot who missed the arrester wires would simply open the throttles and go around again. There was more to it than that, however.



USS Enterprise (CVN-65)

The original British "angle off" was only 4°, which was not sufficient for the U.S. Navy, because it didn't leave enough room forward for aircraft parking. The British carrier operations were primarily anti-submarine missions which, with slower, longer-range aircraft resulted in a lower sortie rate. The air defense and attack operations which characterized the U.S. Navy required more deck space forward for refuelling and launching aircraft. By doubling the angle of the landing area, however, the concept looked feasible.



The capability of the steam catapult is evident in this 1962 photo of a 33,900-pound F3H-2 Demon from the *USS Coral Sea (CVA-43)* at anchor in Yokosuka, Japan. (USN)

Another problem was solved by replacing the then-current approach-and-cut-power-to-land pattern with a flatter, full-power approach, which was necessary if the aircraft did miss the wires and had to take off immediately. In the spring of 1952, while angled deck markings were being painted on the *USS MIDWAY (CVB-41)* and *USS Wasp (CV-18)*, a group of sixteen carrier suitability pilots began field carrier landing practice using the new approach on a runway at the Patuxent River Naval Air Station.

The concept was proven at sea on March 2 and May 27, 1952. Over 300 landings were made using the new approach technique. Aircraft tested included Grumman's F-9F2 and F-9F5 Panthers, the F-3D Skynight and AD Skyraider by Douglas, and the McDonnell F-2H2 Banshee. The success of the experiment prompted the Navy to modify an *Essex*-class carrier with a real angled deck. The ship selected was the *USS Antietam (CV-36)*, and the deck angle was standardized at 10-1/2°. On January 12, 1953 CAPT. S.G. Mitchell, USN, made the world's first true angled-deck carrier arrested-landing in a North American SNJ trainer.

The Steam Catapult

Second in the degree of importance was the advent of the steam catapult. The physics of catapulting an aircraft is basic. For the most efficient catapult stroke, a constant acceleration is ideal. The next most important feature is the distance through which it operates, and the shorter the braking distance, the longer the power stroke that is available. The hydraulic catapult technology employed by the U.S. and British Navies in WWII reached its limit in the H-8 catapult, which is installed on the later *Essex*-class ships. As aircraft weights and stall speeds rose, it became increasingly difficult to safely launch jet aircraft with hydraulic catapults.

A Royal Navy Volunteer Reserve officer, CDR. C.C. Mitchell, OBE, proposed in 1948 that steam from the carrier's propulsion system be harnessed to provide energy for the catapults. When his design was completed and the concept tested, the Royal Navy installed a full-scale steam catapult in *HMS Perseus*, which subsequently conducted over 900 successful launches, including more than 100 with live aircraft.

In February 1952 the British sent *Perseus* to the United States for tests by the U.S. Navy. After the catapult was calibrated with dead weight shots at the Philadelphia Naval Yard, *Perseus* steamed to Norfolk. For a three-day period the same month, and while moored to a pier at the Naval Base, the steam catapult successfully launched F-30s, F-9F2s and F-2Hs. One F-3D was launched with a ten-knot downwind: had an H-8 hydraulic catapult been used, 28-30 knots of headwind would have been required.

As a result of these tests, the U.S. Navy quickly initiated negotiations with the British for the purchase of five steam catapults, and the rights to manufacture the Mitchell design in the United States. One of the five purchased catapults was installed at the Naval Air Engineering Center, and two each were installed on the *USS Hancock (CV-19)* and *USS Ticonderoga (CV-14)*. The sixth and all subsequent steam catapults were manufactured in the United States, using higher steam pressures and longer deck runs, but otherwise unchanged from Mitchell's basic design.

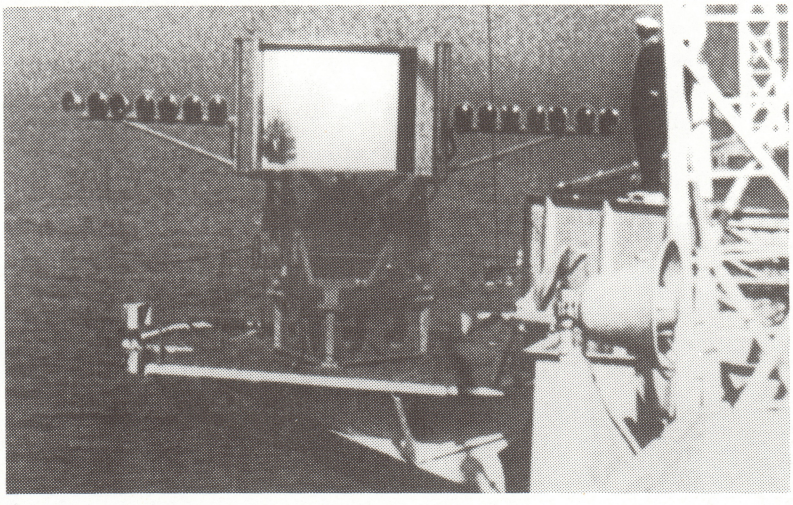
The Mirror Landing System

The quantum leaps in capability which accompanied the angled deck and the steam catapult chased the bottle neck to the Landing Signal Officer's paddles. The limitation of the human eye rendered the paddles useless at distances over 1,000 yards. Additionally the LSO could only work one aircraft at a time. The solution was an invention of Royal Navy Commander H. C. N. Goodhart, and it was called the Mirror Landing Sight.

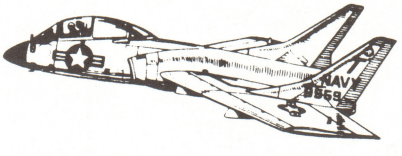
Basically the mirror landing system (as it is now called) is a large mirror, concave around its horizontal axis, like a section of a cylinder. Pointed astern and angled slightly upward, the mirror is gyro-stabilized for the ship's movement. It can also be adjusted to compensate for the approaching aircraft's type and fuel load. A powerful light source aft of the mirror is aimed such that a cone of light is reflected up the aircraft's optimum glide slope. If the pilot is in the center of the cone of light, he sees a white spot, or "ball" in the middle of the mirror. A horizontal row of green datum lights on either side help him to reference the ball. In addition, he receives a continuous aural indication of air speed in his earphones, so he doesn't have to take his eyes off the mirror during the approach.

The LSO is still stationed on his platform at the rear left corner of the flight deck, and can initiate a "wave off" with his "pickle switch," which throws a flashing red light into the mirror. He also has radio contact with the pilots as they fly the pattern. When he sees it, the pilot "calls the ball," followed with his aircraft type, side number and fuel state, e.g., "TWO ZERO FOUR, CRUSADER (aircraft side number and type), BALL, TWO POINT FOUR (I see the ball. I have 2,400 pounds of fuel remaining.)"

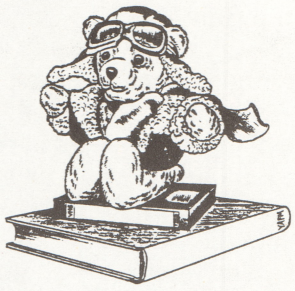
The angled deck steam catapult and MLS were all adopted by the U.S. Navy in a long series of rebuilding and modernization programs. Project 27A, initiated in June 1947, strengthened the decks of *Essex*-class carriers so they could operate jet aircraft up to 20 tons in weight. After the successful angled deck trials, the modernization program was enlarged to include angled deck and steam catapult under Project 27C. Eventually 14 *Essex*-class CVs were remodeled to 27C specifications, and its provisions were extended to the three *Midway*-class carriers as Project 110. Although the angled deck was a British innovation, the Royal Navy first tested one when *Antietam* was "loaned" for that purpose. It is one of history's ironies that the major contributions which were responsible for the continued dominance of the seas by the U.S. Navy were the products of a naval power already in decline. ✪



An early experimental installation of the mirror landing system. (Royal Aircraft Establishment, Farnborough)



F7U-3 Cutlass



Armchair Aviator

by Jim Hanford

Carrier Aviation from the Fifties Through Vietnam

Gillcrist, Paul T., RADM, USN (Ret.); *Feet Wet: Reflections of a Carrier Pilot*, (Pocket Books – NY, NY); 1991; 413 pp, illus. & glossary.

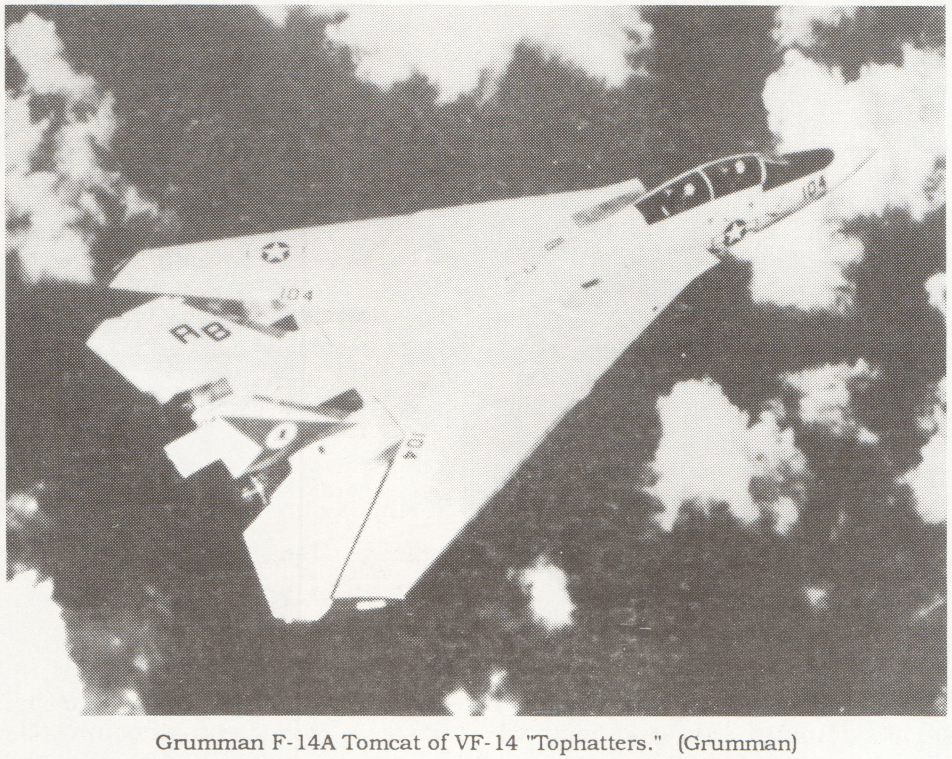
Grant, Zalin; *Over The Beach: The Air War In Vietnam*; (Pocket Books – NY, NY); 1988; 343 pp.

These books provide a good overview of what it is like to operate jet aircraft from a modern U.S. Navy aircraft carrier. *Feet Wet* should probably be read first, because of its description of how carrier operations have evolved since the end of World War II. Gillcrist is a pilot who first qualified in the SNJ, landing on board a straight-deck carrier in 1953. At the same time, however, the design of carriers, their aircraft and their operating procedures were undergoing the greatest changes in their history.

Through clear descriptions and many anecdotes, Gillcrist relates how carrier aviation was forced to adopt major changes or become extinct. The decade of the 1950s was most crucial for Naval Aviation, because the marriage of jet aircraft and carrier operations initially resulted in an unacceptably high rate of aircraft accidents with attendant fatalities and injuries. For example, in the early fifties, more than 700 Naval aircraft each year ended up in smoking wreckage, killing over 200 pilots and aircrew.

There is probably no better narrator of the subject than Gillcrist, who for nearly thirty years flew off carriers in aircraft ranging from propeller-driven SNJs and F6Fs all the way up to F-14s. During this time he was one of the Navy's top fighter and test pilots, breaking in a new generation of aircraft and carriers, winning 17 combat decorations in Southeast Asia, and surviving two ejections. When he made his last carrier landing in an F-14A on the *USS Kitty Hawk (CV-63)* on October 21, 1980, he became the first admiral to do so.

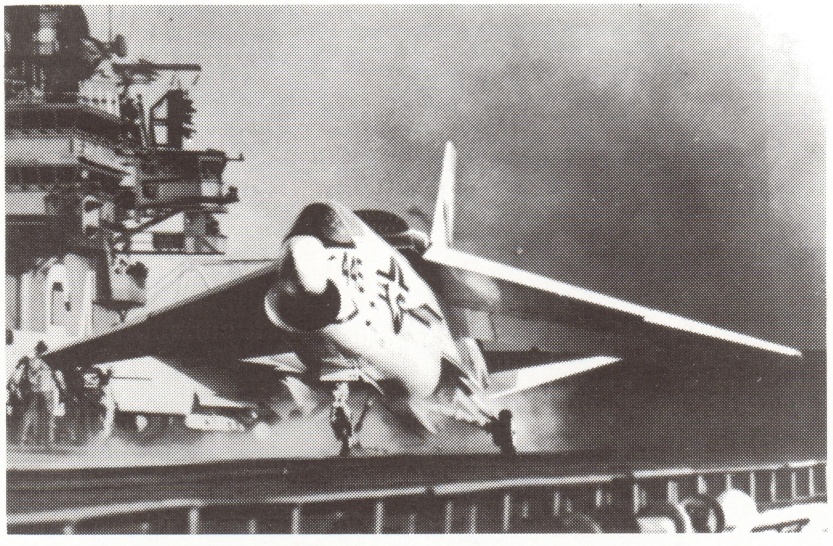
He describes not only the big picture, but also the day-to-day procedures which are part of every Navy pilot's stock in trade. Many of his anecdotes are humorous and/or poignant. My favorite is when he discovered, just as he was lining up an F9F-8 Cougar for a landing at NAS El Centro, that he was sharing the cockpit with a real, live Sidewinder. Although "... only about eighteen inches long... [he] knew it was one of the most poisonous members of the rattlesnake family." Moreover, it was coiled to strike and "... looked mad as hell." If you want to know how it ended, get this book, which is available in paperback for $4.95.



Grumman F-14A Tomcat of VF-14 "Tophatters." (Grumman)

✦ ✦ ✦

Over The Beach is a true account of the pilots in VF-162, who flew the Chance Vought F-8 "Crusader" during three deployments to Southeast Asia on the *USS Oriskany (CV-34)*. The author served as an army officer in Vietnam, and then returned as a reporter for *Time* and *The New Republic*. Writing the book began with an interview in July 1966 of Rick Adams, a VF-162 pilot who became the first American to be shot down and rescued twice. Although he spent five years in Vietnam, and visited a number of U.S. Navy ships, Grant wrote, "Never did



Ling-Temco-Vought F-8D from VF-124 is ready to launch from *USS Constellation (CV-64)*. The flying tail and variable incidence wing are in the take-off position. (LTV)

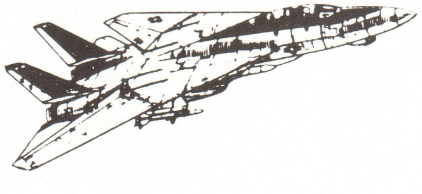
I meet any group more interesting than Squadron 162." That thought became the driving force behind the book.

Although published in 1988, the book reads as if it happened just yesterday. The author kept tabs on the squadron throughout the time he covered the war. On his return to the United States in 1971 he began to research the subject seriously. What emerged is an account of the air war as seen through the eyes of the participants and their loved ones, both in the heat of battle and again (for the survivors) through the perspective of time. Grant deliberately chose not to publish when the initial research was complete, because he felt that the aviators' story would be diminished by the politics of a nation divided over the war.

While it concentrates on the actions of a group of pilots, the narrative also describes events at higher levels which, unknowingly had a major impact on their survival. I believe that this book could form the basis for an excellent movie, because of its high drama. International politics, the resistance put up by the enemy, and squadron leadership and personalities all affected the task which these men undertook. Grant vividly describes war without the glory. I was enraged to read of all the civilian-imposed restrictions which greatly increased the risks against a pilot's safe return from a mission. I was surprised at the number of pilots who ultimately "turned in their wings."

Grant explains that any time a Navy pilot thought he'd had enough, he could request removal from flying status, however it was not a decision to be taken lightly, and a relatively small number actually did it. Depending upon circumstances, the pilot might never again fly for the Navy, and it would be very difficult to remain in the company of those with whom he had previously flown.

The only criticism from this reviewer is the omission of photographs, with the exception of the cover photo. Ironically it portrays an A-4 "Skyhawk" attack aircraft. Undoubtedly the attack pilots were just as courageous as the fighter jocks – but they weren't fighter jocks. ✪



F-14A Tomcat

MEMBERSHIP REPORT

by Charlie Lingenfelter

The total membership in the Yankee Air Force as of July 2, 1994, is 1,670. This is an all time high, and we are hoping the upward trend continues.

Please welcome the following 43 new members:

Willow Run:
#4648 **Marcus May**, #4649 **John J. Thomas**, #4650 **Robert G. Seager**, #4651 **Berge B. Manoogian**, #4652 **Peter Melenyk**, #4653 **George Heifner**, #4655 **Jack H. Jensen**, #4656 **Scott J. Quamme**, #4657 **James W. West**, #4658 **Thomas F. Burch**, #4660 **Reginald Ion**, #4661 **Gretchen Maricak**, #4663 **Claude T. Phifer**, #4664 **Cosmin Ene**, #4665 **Brandon J. Ion**, #4668 **George G. Schmidt**, #4669 **William R. Hunter**, #4670 **John Geisik**, #4673 **Joseph R. Walczak**, #4674 **Joan Walczak**, #4675 **Robert R. Smith**, #4676 **James Lee**, #4677 **Matthew Ion**, #4678 **Paul E. Rothe**, #4679 **William Beatty**, #4680 **Dennis Dupuie**, #4681 **Peter E. Chestnut**, #4682 **Eugene S. O'Neill**, #4683 **Robert J. Hemming**, #4684 **Joseph C. Warrow**, #4685 **Scott A. Leavitt** and #4686 **Robert W. Lerner Sr.**.

Wurtsmith:
4659 **Dennis C. Sorgatz**, #4662 **Bryan Crone Jr.**, #4666 **William L. Stone**, #4667 **G. Helen Stone**, #4671 **Edward L. Skarbek** and #4672 **Gerald Pierce**.

Mid-Michigan:
#4688 **Michael D. Klenk** and #4689 **Seth Klenk**.

Saginaw Valley:
#4654 **Stephanie J. Manial** and #4690 **Nancy C. Rogalski**.

Wisonsin/Illinois:
#4687 **Chad N. Koppie**.

Footnote: Have you considered a bequest in your personal will, to leave a portion of your estate to the Yankee Air Force and Museum? ✪

DIVISION NEWS

NED Building Plans Approved

Major roadblocks on the Northeast Division's route toward a new home were overcome in June, when their application was approved by the Wantage Township Boards of Zoning and Planning. This clears the way for NED to solicit bids from prospective contractors for site preparation and erection of the building. The hangar could be completed by Thanksgiving 1994. The major hurdle remaining, however, is financial.

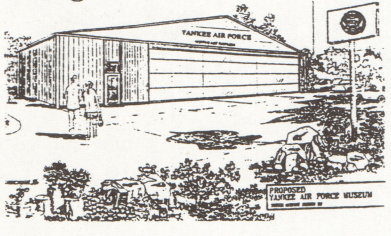
This project has had a very long gestation period. NED received its eviction notice in November 1989. They had moved from their old facility by the first week of January 1990. A Site Selection Committee was formed, and numerous sites were considered. By March 1991 the division had settled on Sussex Airport as the site of their new home. (It should be noted that Sussex was the only airport that really wanted them. This is not a reflection on the YAF, but rather on the scarcity of airport space in New Jersey.) In September the division had decided on the make and type of building they wanted, and in February 1992 placed a deposit of $3,000 on a 48' x 75' structure.

One reason the site selection took so long was the amount of deliberation at each step of the way. At the same time, however, members were drafting layouts to determine how best to divide and utilize the building's 3600 square feet. With these design proposals and some rough guesstimates on costs, their bargain $28,000 building was taking on the look of major construction. Then entered the Americans With Disabilities Act, whose requirements again upped the ante. Now the estimated cost for complying as a public-use facility had risen to over $70,000!

In the Spring of 1993 the Division Council decided to downsize the project. Instead of building a ready-to-use museum facility, they would only erect a building for a hangar, work and storage space. This would buy relief in two ways: (1) it would negate the need for a variance for the museum (which was cited as a non-conforming use in an airport hazard zone); and (2) it would once again make the total cost feasible. When the building is finished, however, there cannot be a gift shop, nor can it be called a museum. NED can display their artifacts, and the public will be welcome to see them, but no admission can be charged. Donations, however, can be accepted.

The building manufacturer, Miracle Truss, has been very helpful by holding the building in Minnesota until NED is ready for it. Occasional payments have been made to show good faith, as well as to pay off a part of the cost.

In the fall of 1993 a surveyor was retained to draw up an official site plan for submission to the township boards. Although completed in November, the plan's submission was delayed first by cancellation of some meetings due to weather, and postponements over unfulfilled obligations of the airport owner. NED finally went before the Zoning Board on June 1st and the Planning Board on the 21st. In both meetings the project was briefly described, questions were answered, and the plan was approved. Building Committee Chairman **Vince Menza** expressed his amazement at how quickly the application was approved once it got on the agenda.



Artist **Vic Menza's** rendering of NED's new home.

The next step is to work with the building inspector to pull together a bid package which is in accordance with all applicable codes. It was complete by early July, and included site preparation, concrete work and pillars for the building. It has been sent to four contractors, and bids were due by August 8th. One glitch uncovered during a bid preparation is that if an actively flying aircraft is stored with fuel in its tanks, the building must have explosion-proof electrical fixtures and wiring, which will add an additional $4,000 to the cost.

Raising funds for this project has been equally as difficult as getting the site and the building, and has severely challenged the Division Council. In a July progress letter, Chairman **John D. Golderer** noted the difficulty in raising funds, as well as appreciation for the generous response from YAF members. The all-member solicitation in the summer of 1993 realized $6,350. The project is still almost $20,000 short of the goal however, and additional donations will be gratefully accepted.

(The Editor gratefully acknowledges the assistance of John D. Golderer's letter and the report by ***Peter Vajsabel*** *in the June/July issue of* The Yankee Clipper, *from which much of the above information was taken.)*

✦ ✦ ✦

F-84s Spur MMD Tours

With the arrival of the RF-84K Thunderflash reconnaissance aircraft, there has been an increasing number of visitors to the Mid-Michigan Division hangar. The first official group to visit was the Lapeer Big Brothers on June 11. Steve Mason, pilot and part owner of a Cessna 150 is a Big Brothers sponsor. He displayed his aircraft for the approximately 20 children and 10 adults in the group. Dupont Airport flight instructor Barry Sutton spoke on flying, then the group walked over to the hangar for refreshments and the jets.

Members **Tom Schiermboch**,

Ralph Gilpin and **Bob McKay** described the aircraft and encouraged the youths to look them over, inside and out. Many sat in the ejection seat, and everyone seemed to have a good time. There may have even been some future pilots in the group.

Later in the summer the RF-84K nose wheel and left main wheel were overhauled and the struts were painted silver. All the plane's wheels were flat and locked-frozen due to weathering. The right main still needs work.

The Clark tug has been mechanically restored, including a new battery, wiring harness, plugs, hoses, ignition key-start and replacement gages, as well as brake repairs. The engine has been started, and the tug driven around, but it has yet to tow anything. Body repairs and painting are now in progress. An 11 1/2-foot tow bar has been fabricated, and a member has donated his pintle hook to replace the former tow-loop.

The division's new 12-feet by two-feet sign proclaiming "Yankee Air Force - Mid-Michigan - Third Division" is now hanging high on the hangar, and has been noticed in the local newspaper. The county paper also did a story on the MMD Open House.

Initial returns indicate the Open House was a success, with an estimated 2,000 in attendance. They sold 895 breakfasts and made $117.25 in sales from their retail trailer. They expect to clear about $2,500, which is nearly double what they did last year.

MMD Supports CAP Camp

MMD members and Civil Air Patrol Majors **Len** and **Sharon Wright** and Captain **Randy Carrels** were mentioned in an article on the 1994 Flight Encampment which appeared in the July 3rd edition of *The Flint Journal.* The Flight Camp, which offers a week of intensive aviation training, was held the week of June 13th at the Flint Bishop Airport.

Cadets spend about half the days in ground school, and even spend time training in the evening before they go to bed in the dormitory at Baker College. It is possible for a student to solo during the camp, and many cadets get a good start toward their pilot's license. All applicants have to pass a board of review to qualify for the camp, and it is considered an honor to be selected from among the 700 Michigan CAP cadets.

The Wrights are the camp directors, and Carrels is a CAP public affairs officer. The MMD supported camp is another way of providing the Louis C. Hook Memorial Award to a deserving CAP Cadet. This year the $250 stipend went to John T. Tennant.

(Information for the above report was excerpted from the June and July editions of Wing Tips, *the MMD newsletter, and from the MMD Liaison Report for August. ~ Editor.)*

✦ ✦ ✦

Thunder Over the AuSable - YAF Style -

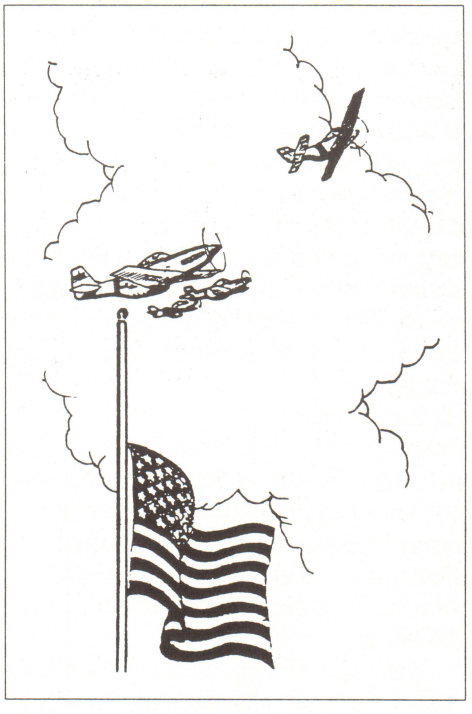
Early indications are that the Wurtsmith Division's Open House, which was the newest part of the Oscoda River Days Festival held on July 30-31, was a great success. Attendance was estimated at over 3,500 people. **Marv Poland** and his crew served over 250 breakfasts on Sunday, as well as snacks and lunches both days. Event Chairman **Ken Crone** gave special thanks to the aircraft crews who took "almost all of Oscoda" aloft and flew over the AuSable River with a "heck of a roar!"

Others singled out for recognition included **Ken Temple** and the Explorer Scouts who parked nearly 1,600 vehicles. **Dean Wiltse**, **Peggy Erb** and **Ray Garcia** provided 16 American flags to flank the beach access gate. **Bill Erb** and **Jerry Brandt** prepared and erected six informational signs about the YAF, and also collaborated on "Wurtsmith Kate," a 1940's-era practice bomb, converted into a donations container, complete with a woman's face and wig.

Final figures were not available at press time, however it was apparent that the division came through "in the green." Profits are expected in all areas: Food service, gift shop, L-19 and Wurtsmith Kate donations, and dog tags. While only a few were mentioned by name, the divisional leaders extend their sincere "Well done" and "Thank you" to the YAF members from the Seventh Division and elsewhere, who so graciously gave of their time and resources to ensure the event's success.

Two weeks prior to the Open House, Wurtsmith's Security Chief **Ken Temple** earned 2nd Place Marksman's honors at the Michigan Law Enforcement Explorer Pistol Shoot in St. Joseph. He competed against the top 50 Explorers in the state. "Bravo Zulu" Ken!

(Information for this report was excerpted from the August issue of Wurtsmith Wings, *the divisional newsletter. ~ Editor.)* ✪



In Memory...

Ford Johnson
YAF #L0755 WR

Ford Johnson passed away June 24, 1994. He became a life member when he joined the Yankee Air Force in July 1982. A USAF retiree, Mr. Johnson lived in Seattle, WA.

MUSEUMOLOGY

Gabreski Leads Off USAFM Lecture Series

Colonel Francis "Gabby" Gabreski will lead off the 1994-95 Guest Lecture Series at the U.S. Air Force Museum. The action-filled line-up includes three fighter aces and three bomber pilots from World War II and a fighter pilot from Vietnam (see box below).

As C.O. of the 61st Fighter Squadron of the famous 56th Fighter Group, "Gabby" became the leading ace in the European Theater with 28 aerial victories and three more on the ground. During the Korean War he became a jet ace with 6.5 aerial kills. The man who almost washed out of flight training is expected to talk about his exploits in two wars.

Two other fighter aces are on the agenda: Colonel Hershel "Herky" Green scored his 18 victories in the Mediterranean Theater, flying P-40s, P-47s, and finally P-51s with the 325th Fighter Group. He is one of a handful to become an ace in two different types of aircraft. His best day was January 30, 1944, when he scored six times, and the other members of his flight bagged nine more. The "Fearsome Foursome" accounted for 15 of the group's 37 victories that day. Mr. Oscar Boesch, who flew on both the Eastern and Western Fronts, presents the other side of the war. In a year's action he survived two mid-air collisions, four bail-outs and eighteen victories, as he "wrote off" eight FW-190s.

Colonel George "Bud" Day was one of the nation's most experienced fighter jocks, with over 4,500 hours of single-engine jet time. He is also the nation's most-decorated officer, who holds nearly 70 military awards and decorations, including the Medal of Honor. As the first C.O. of the "Misty Super FACs" F-100 Squadron, he was shot down in 1967, spending 67 months as a POW. He was the only POW to escape in the North and then to be recaptured by the Viet Cong in the South.

Major General Ramsey Potts flew B-17s with the Eighth Air Force during WWII, and will discuss WWII strategic bombing in both the European and Pacific Theaters. Mr. Thomas Griffin and Colonel Travis Hoover were participants of the 1942 Doolittle Raid on Tokyo, and will talk about their recollection of that event. Hoover went on to fly B-24s and B-25s in the Mediterranean Theater, and then flew P-38s from England for a combined total of 73 combat missions. After the Tokyo Raid, Griffin transferred to North Africa, where he was subsequently shot down and became a POW.

USAFM 1994-95
Guest Lecture Schedule

Tues. Sept. 20, 1994
"A Fighter Pilot's Life"
Col. Francis Gabreski, USAF (Ret.)

Wed. Oct. 19, 1994
"Return With Honor"
Col. George Day, USAF (Ret.)

Thurs. Nov. 17, 1994
"A Fighter Pilot Remembers World War II"
Col. Hershel Green, USAF (Ret.)

Tues. Jan. 17, 1995
"The Joy and Horror of Flight"
Mr. Oscar Boesch

Wed. Feb. 22, 1995
"Strategic Bombing During World War II"
MGen. Ramsey Potts, USAF (Ret.)

Thurs. March 23, 1995
"The Doolittle Tokyo Raid"
Mr. Thomas Griffin and
Col. Travis Hoover, USAF (Ret.)

The lectures begin at 7:30 PM in the USAFM's Carney Auditorium, and are free to the public. Museum doors and the gift shop open at 6:30 PM. There is normally a question-and-answer period after the lecture, then the speaker remains to autograph books he has written and/or in which he appears. To confirm that the lecture will be held as scheduled, call the Public Affairs Office at (513) 255-4704.

Events Scheduled at The Air Zoo

The Kalamazoo Aviation History Museum will sponsor the following aviation-related events later this year:

- Now - Oct. 1: Aviation Art of Bill Alcinious; delicate drawings of classic aircraft by a former YAF member.
- Sept. 17: Operation Market-Garden talk by former glider pilot Darl Watters; 1:30 PM.
- Oct. 22: Special program on the Philippines invasion and the Battle of Leyte Gulf, organized by Gerald Martin; 1:30 PM.

The museum is also trying to locate knowledgeable speakers for programs on the sinking of the *Tirpitz* (Nov. 17), and the Battle of the Bulge (Dec. 17).

The museum is located south of the Kalamazoo Airport (I-94 Exit No. 78, Portage Road). It is open daily except New Year's, Easter, Thanksgiving and Christmas days. From June through August the museum's hours are: Monday-Saturday 9 AM - 6 PM (8 PM on Wednesday), and Sunday Noon - 6 PM; from September through May: 9 AM - 5 PM Monday through Saturday, and noon - 5 PM Sundays. There is an admission charge, with discounts available for large groups. Call the museum at (616) 382-6555 for more information.

The Air Zoo opened a new annex building this past June, which will allow visitors to see approximately 15 more aircraft in the collection as well as the active restoration of other aircraft, for a small additional charge. The museum also offers rides in a 1929 Ford Tri-Motor from

May through October, weather permitting, every Wednesday at 2 PM, and on two weekends a month (Saturday and Sunday) at 2 PM. Additional flights may be scheduled if there is sufficient interest. Cost is $50.00 per person.

National Soaring Museum Celebrates 25th

The National Soaring Museum in Elmira, New York will celebrate its 25th anniversary on September 23-24, 1994, with special events and lectures by sailplane designers/builders Paul B. MacCready and Stan Hall. Dr. MacCready designed the man-powered aircraft, *Gossamer Albatross*. The NSM is located in a 28,000 square-foot facility on Harris Hill outside of Elmira. Harris Hill is a popular site for soaring activities as well as the official repository of America's sailplane heritage. For additional information, call them at (607) 734-3128.

Yankee Air Museum Library Request

The library has received numerous issues of the 8AF 2nd Air Division *Journal*, courtesy of the late **Frank Day**. Library Chairman **Harold W. Sherman** would appreciate the donation of current and future *Journals*, starting with the Spring 1994 issue. Additionally, there are a number of holes in the collection, hence the library is seeking donation of the following issues:

Vol. 1-10; 1962-1971
Vol. 11, Nos. 1-3; 1973
Vol. 12, No. 1; 1974

The following issues of the Liberator Club *Briefings* are also being sought: Numbers 1-3, 5, 6, 10, 11, and 17. The loan of any of the above materials for copying would also be appreciated.

✪

Proposed Amendments to Yankee Air Force, Inc. By-Laws, Election - 1994

Proposed By-Law Change #1

RATIONALE: Concern has been expressed that it is theoretically possible to prevent the Board from meeting at all. To correct this, the proposed language is inserted after the word "necessary" and ahead of the word "to." This is consistent with regulations that impose a similar requirement on Division Chairs.

CORPORATE BY-LAWS
ARTICLE VI,
Board of Governors, Section 4

NOW READS:
The President shall convene the Board of Governors as often as necessary to carry out corporate responsibilities.

AMEND TO READ:
The President shall convene the Board of Governors as often as necessary, *but at least quarterly,* to carry out corporate responsibilities. *In the event of refusal or neglect by the President to so convene the Board of Governors for a period of more than three consecutive months, the Vice President is empowered to convene the Board and shall act as Chairman of the Board for that session per Section 2 of the Article VI.*

❒ **YES** ❒ **NO**

Proposed By-Law Change #2

RATIONALE: The President now annually composes the By-Laws Committee by appointing two members from the Board and two voting members at large. These four are combined with the two standing members: the Vice President, who is the chair, and the Corporate General Counsel. The six then constitute the By-Laws Committee per Article VII, Section 5. Concern has been expressed that the four appointees could create a committee that the Vice President could not work with (the Counsel functions as a historian of things done in the past and sees that the proposed changes are consistent with the present by-laws and the Michigan Non-Profit Act). To give the Vice President greater influence in the committee makeup, the following is proposed to allow the Vice President two appointments, one from the Board and one at-large. The present Section 5 will be split into two paragraphs: a and b, with ¶a containing the proposed change.

CORPORATE BY-LAWS
ARTICLE VII - COMMITTEES
A. Standing Committees
Section 5 - By-Laws Committee

NOW READS:
The By-Laws Committee shall be chaired by the Vice President and shall consist of additionally ~~two members of the Board of Governors, two members in good standing entitled to vote, all appointed by the President and the Corporate General Counsel, if one has been appointed~~. The committee may initiate recommendations for changes and solicit and receive for evaluation suggestions from any class member. The committee will cause to be published proposed changes in the By-Laws in the national publication sufficiently in advance (in order to receive and evaluate comments from the membership) of the general or special election, wherein the proposed changes will be voted upon. Proposals for changes may be withdrawn from consideration prior to certification to the Election Committee, publication notwithstanding. All such proposed changes must be ratified by the Board of Governors prior to certification to the Election Committee.

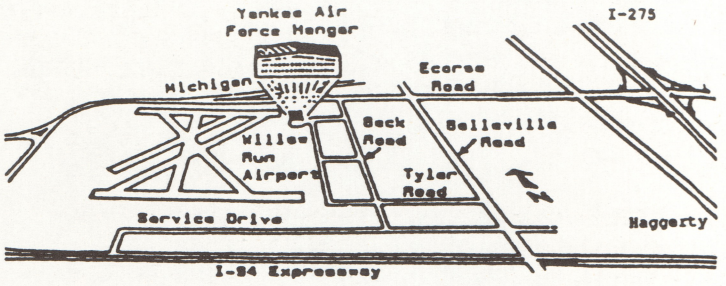
AMEND TO READ:
Section 5.a. By-Laws Committee. The By-Laws Committee shall be chaired by the Vice President and shall consist additionally of *one member of the Board of Governors and one member in good standing entitled to vote, chosen by the Vice President, and one member of the Board of Governors and one member in good standing entitled to vote, chosen by the President. The Corporate General Counsel shall be an ex-officio member of this committee.*

Section 5.b. Responsibilities. The committee may initiate recommendations for changes and solicit and receive for evaluation, suggestions from any class member. The committee will cause to be published proposed changes in the By-Laws in the national publication sufficiently in advance (in order to receive and evaluate comments from the membership) of the general or special election, wherein the proposed changes will be voted upon. Proposals for changes may be withdrawn from consideration prior to certification to the Elections Committee, publication notwithstanding. All such proposed changes must be ratified by the Board of Governors prior to certification to the Elections Committee.

❒ **YES** ❒ **NO**

YAF HEADQUARTERS - WILLOW RUN AIRPORT

Take I-94 to Belleville Road exit, North to Tyler Road, west to Beck Road, turn right and enter through second gate on your left. Or take I-275 to exit 20 – Ecorse Road. Take Ecorse Road west to Beck, proceed south to first gate on your right.



CALENDAR

I. Standing Monthly Meetings:

1st Wed	Hq. Div. General Membership (WR)
Quarterly	Membership Staff (Tues following WR Gen. Membership)
2nd Tue	Wurtsmith Div. Council (Place TBA) - 12:00 noon (WD)
2nd Tue	WI/IL Stateline Div. Gen. Membership - 7:00 pm (WI/IL)
2nd Tue	WI/IL Div. Council (following Gen. Memb.) (WI/IL)
2nd Wed	Mid-Michigan Div. Combined Council/Gen. Membership (MMD)
2nd Wed	B-17 Restoration Crew (WR)
2nd Sat	Saginaw Valley Div. General Membership - 9:30 am (SV)
2nd Sat	Security Committee - 10:00 am (WR)
2nd Sat	Static Aircraft Restoration Crews - 2:00 pm (WR)
3rd Wed	National Board of Governors (WR)
3rd Wed	Northeast Div. General Membership - 7:00 pm (NED)
3rd Wed	Wurtsmith Div. General Membership - 7:00 pm (WD)
3rd Sat	Saginaw Valley Div. Council (SV)
4th Tue	WI/IL Stateline Div. Council - 7:00 pm (WI/IL)
4th Wed	Northeast Div. Council (NED)

II. Future Events

Oct. 22	15031st Air Transport Wing tour (est. 40) (WR)

III. Notes

- An entry marked with an asterisk (*) indicates more information may be found elsewhere in this issue.
- All meetings listed above are open to all YAF members.
- All meetings begin at 7:30 pm, unless otherwise noted.
- Any additions or corrections to the calendar should be submitted to Jim Hanford, (313) 562-3283, by the copy deadline shown on the right.

President.....John Snider
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Graphic Design.....Gary Redfern
Staff.....Todd Hackbarth, Charlie Lingenfelter, Dennis Norton, Robert Pauley, Harold Sherman, Jack Stankrauff.
Distribution.....Charles and Jo Ann Lingenfelter, Dean and Jeanne Green, Soren Kalen.
Typesetting & Printing.....Cheri and Roy Stearns.
Proofreading.....Lana Presley and Brian Roberts.

Published bi-monthly for Yankee Air Force, Hangar 2041, A Street, Willow Run Airport, P.O. Box 590, Belleville, MI 48112-0590 (313) 483-4030. Yankee Air Force Inc. is a non-profit corporation organized under the laws of the State of Michigan, and exempt from taxation under IRS Codes Section 501 (C) (3).

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YANKEE AIR FORCE
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